PowerLogic
selection guide and technical overview

Merlin Gerin
Square D
Telemecanique

Schneider Electric

PowerLogic:

Metering and monitoring for each level of your power system

As a leading supplier of electrical distribution and power monitoring equipment Merlin Gerin has the portfolio of products required for each level on your electrical network.

Comprehensive **Power**Logic metering can provide real-time and event information to help mitigate and diagnose problems effectively and efficiently. **Power**Logic metering can also help you improve system reliability, reduce utility costs and increase equipment utilisation.

With a fully instrumented **Power**Logic system it is possible to achieve savings that result in an almost instantaneous return on investment.

Merlin Gerin can help you achieve this by providing you:

Specific metering for each area of the system

PowerLogic metering and monitoring devices adhere to the highest revenue class accuracy and the quality standards set by IEEE1159, EN50160 and IEC61036. For critical circuit monitoring, **Power**Logic meters can simultaneously time stamp and capture events with multiple waveforms while collecting interval logging for cost allocation. Other **Power**Logic meters can provide the facility to meter and monitor other utilities and perform control functions.

Increased savings

With a **Power**Logic system we encourage you to think below the surface for additional savings. By installing a **Power**Logic system and managing the resource you can realise a 5% reduction in utility costs – but this is just the tip of the iceberg.

Looking beyond the utility bill – or below the surface can derive major savings using a **Power**Logic system. Typically, an additional 5% can be saved through improved equipment utilisation, avoiding unnecessary capital purchases. As much as 10% further savings can be gained by improving power system reliability.

Government recognised technology

The **Power**Logic range of circuit monitors and meters are recognised by the Government led Enhanced Capital Allowance (ECA) scheme and appear on the Energy Technology List (ETL) for automatic Monitoring and Targeting (aM&T).

Open and high speed communications

PowerLogic Systems are built on open industry Modbus and Ethernet TCP/IP standards.

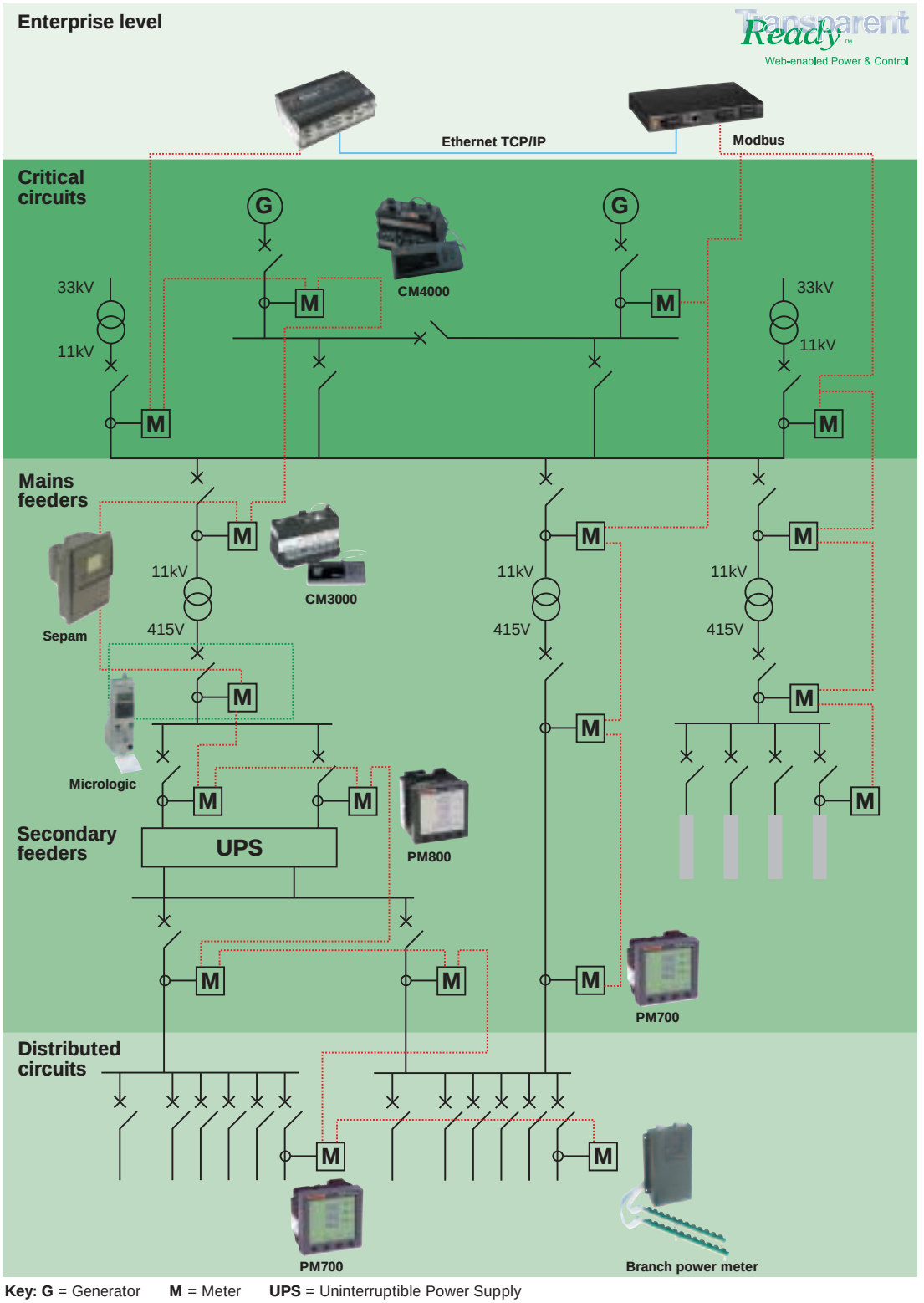
Information via a web browser

PowerLogic meters allow you to view instantaneous reading directly connected to devices using your standard web browser. Optional modules allow you to collect historical data and display graphical images displaying full system perspective. The **Power**Logic system forms an integral part of the Schneider Electric Transparent Ready solution.

Transparent Ready™
Web-enabled Power & Control

PowerLogic:

Metering and monitoring devices



Key: G = Generator **M** = Meter **UPS** = Uninterruptible Power Supply

PowerLogic:

Metering and monitoring devices

At Schneider Electric, we have the most complete and the most advanced line of power monitoring products for each level of your power system.

Products like the award winning Power Logic **CM4000T circuit monitor and the unparalleled Power**Logic **Power Server help keep you at the forefront of metering and monitoring technology.**

Multi-circuit metering

- Basic single phase metering of up to 24 individual circuits
- Highly accurate industrial grade fixed or splitcore CT's
- Precision microprocessor based metering electronics
- Exceptional metering accuracy and reduced installed cost
- Industry standard Modbus communications

Power meters

- Basic metering functions allow metering of current, volts, power, energy and demand readings
- Power quality readings include total harmonic
- Distortion for current and voltage readings
- Minimum/maximum values
- Alarm/relay functions
- Event and data logging on pre-configured values
- Industry standard Modbus communications

Series 3000 circuit monitors

- Advanced metering functions allow all the basic, as well as phase rotation, demand voltage and ground current readings
- Data logging with 8MB of memory standard
- Sag/swell monitoring
- Trending and forecasting functions
- Optional web-enabled access directly to meter
- Waveform capture with disturbance monitoring (available on the CM3350)

Series 4000 circuit monitors

- Features all basic and advanced metering functions while providing a 0.04% typical accuracy rate
- 14 data logs and up to 32MB of memory available
- Three types of waveform capture: steady state, disturbance and adaptive
- Sag/swell detection to less than 1/2 cycle
- Trending and forecasting functions
- Optional web-enabled access directly to meter
- 15MHz sampling rate that allows detection of transients lasting only one microsecond (available with CM4000T)

PowerLogic:

Network solutions

Transparent Ready™
Web-enabled Power & Control

Schneider Electric are at the forefront of the integration of web technologies into electrical distribution equipment through the deployment of Transparent Ready™.

Transparent Ready utilises Ethernet TCP/IP to bring all the benefits of web based technology and open networking systems to the the Power Logic **system.**

Ethernet gateway

This Web-enabled ethernet gateway simplifies power monitoring and features:

- Fast 10 or 100 MB/sec communications
- Communications to as many as 64 devices
- Two RS-485 Modbus ports
- Fibre optic port (available on EGX400)
- 8 MB of memory (available on EGX400)
- Web access to any Modbus serial device (available with EGX400)

Power Server

Heavy duty server improves energy data collection and features:

- Display for up to 64 **Power**Logic and Modbus devices
- 10 GB hard drive, 128 MB RAM
- Access to alarms, trends, reports, waveforms and diagrams through standard web browser using PWRSRV750
- Energy and data consolidation including water, air, gas, steam and electric values, to a web accessed interface

PowerLogic:

Accessories to expand your system

Extend the functionality of your Power Logic **system with input/output modules or our range of easy to add accessories including Ethernet connection cards, current and voltage modules and input/output extensions.**

Transparent Ready™
Web-enabled Power & Control

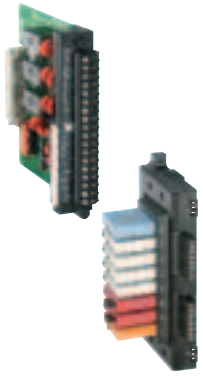
Ethernet communication card

The ECC is an optional ethernet communication card and can be installed in either the CM3000 or CM4000.

It has two main functions:

- Equip the circuit monitor with a fast ethernet connection over a 10/100 Mbits/s copper link or a 100 Mbits/s Fibre-optic link
- Serve as an ethernet gateway for devices daisy chained to its RS485 Modbus port

The ECC card also includes a server for six HTML pages that may be consulted by a standard web browser. The pages may be customised and will display information from the host circuit monitor and/or devices connected to its Modbus port.



Input/output blocks

The optional input and output blocks can be installed in either CM3000 or CM4000

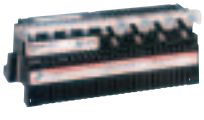
- **IOC44 Card**
  This is an input/output card equipped with:
  - ☐ 4 digital inputs 20-138 V AC/DC
  - ☐ 4 digital outputs including 3 relay outputs and a static output that may be programmed as a pulse output. It may be installed in the option-card slots of the circuit monitor

There are three possible configurations: (1) IOC44 card, (2) IOC44 cards, or (1) IOC44 card and (1) ethernet ECC21 card.

- **IOX I/O Extender (CM4000 only)**
  The IOX input/output extender may be equipped with up to eight plug-in input or output modules. The entire unit connects to the side of the circuit monitor. The input/out modules may be digital or analogue.

  Three pre-equipped versions may be ordered directly, the IOX08, IOX0404 and IOX2411. Other versions may be user prepared by ordering an empty IOX extender and separate I/O modules. In this case, the IOX extender may be equipped with up to a maximum of four analogue modules

Current/voltage modules



- **CVM**
  This is the CM4000 acquisition module for currents and voltages supplied already installed on the CM4000. If the circuit monitor must be recalibrated, this is the only module requiring calibration. It may be installed and removed in the field. This module may also be replaced in the field by a CVMT module (below) to transform a CM4000 into a CM4000T.
- **CVMT**
  This is the CM4000T acquisition module for currents and voltages suitable for the detection of transient phenomena with a 5 MHz voltage-sampling rate. The CVM may also be installed and removed in the field. Supplied already installed on the CM4000T.
- **CVMXR**
  The extended range current/voltage (CVMXR) has the same metering capability as the CVM, with the additional ability to detect and capture up to 100 amperes on directly connected loads for one second, or 20 amperes on directly connected loads continuously. The CVMXR is a class 0.5 module. Some applications for the CVMXR include motor starts or other events with large inrush current characteristics.

PowerLogic

Metering device selection

Selection of the correct devices for your **Power**Logic system is essential to maximise the benefits available.

The table on the following pages displays all the features available on **Power**Logic metering devices. Further information can be found in the technical pages that follow.

PowerLogic:

Metering device selection

	Power meters					Circuit monitors		
	Branch power meter**	PM700 PM710	PM810	PM820	PM850	CM3250	CM3350	CM4000
Basic instrumentation								
Current, per phase	■	■	■	■	■	■	■	■
Current, neutral		■	■	■	■	■	■	■
Current, 3 phase average			■	■	■	■	■	■
Current demand, max., per phase		■	■	■	■	■	■	■
Current demand, max., neutral			■	■	■	■	■	■
Voltage, per phase (L-L, L-N)	■	■	■	■	■	■	■	■
Voltage, 3 phase average			■	■	■	■	■	■
Real power, 3 phase total (kW)	■	■	■	■	■	■	■	■
Reactive power, 3 phase total (kVAR & kVA)	■	■	■	■	■	■	■	■
Power factor, 3 phase total		■	■	■	■	■	■	■
Real power demand, present		■	■	■	■	■	■	■
Real power demand, peak		■	■	■	■	■	■	■
Real energy (kWh)	■	■	■	■	■	■	■	■
Reactive energy (kVARh)		■	■	■	■	■	■	■
Apparent energy (kVAh)		■	■	■	■	■	■	■
Frequency	■	■	■	■	■	■	■	■
Reactive power demand, present		■	■	■	■	■	■	■
Reactive power demand, peak		■	■	■	■	■	■	■
Apparent power demand, present		■	■	■	■	■	■	■
Apparent power demand, peak		■	■	■	■	■	■	■
Predicted real/reactive/apparent power demand 3 phase total			■	■	■	■	■	■
Real energy, in and out (kWh)			■	■	■	■	■	■
Reactive energy, in and out (KVARh)			■	■	■	■	■	■
Min/max readings I, V, F, PF, THD, TOTAL KW KVAR		■	■	■	■	■	■	■
Real, reactive, apparent power, per phase		■	■	■	■	■	■	■
Power factor, per phase			■	■	■	■	■	■
THD, voltage and current per phase		■	■	■	■	■	■	■
Advanced instrumentation								
Voltage N-G						■	■	■
Current, ground						■	■	■
Fund. volt/current magnitudes and ang, per phase				31st	63rd	63rd	63rd	63rd
Fundamental real and reactive power, 3 phase, per phase						■	■	■
Incremental real/reactive/apparent energy in and out, 3 phase total						■	■	■
Harmonic power flows						■	■	■
Trending and forecasting					■	■	■	■
Flicker IEC61000-4-15								Opt
ITIC/SEMI F47/NEMA MG-1-1998						Opt	Opt	Opt
EN50160 pass/fail summary				■	■	■	■	■
Logging								
Memory (std/optional)			Opt	80K	800K	8MB	8MB	8M/32MB
Interval min/max/avg log						■	■	■
Alarm/event log				■	■	■	■	■
Maintenance log				■	■	■	■	■
Min/max log						■	■	■
Time synchronisation								
Block interval demand		■	■	■	■	■	■	■
Clock synchronised demand				■	■	■	■	■
Comms. clock synchronisation				■	■	■	■	■
Command synchronised demand						■	■	■
Input synchronised demand				■	■	■	■	■
GPS clock synchronisation capability						■	■	■

	Power meters					Circuit monitors		
	Branch power meter**	**PM700 PM710**	**PM810**	**PM820**	**PM850**	**CM3250**	**CM3350**	**CM4000**
Alarming								
Setpoint-driven alarms V,KW,KVA,I,PF,KVAR			■	■	■	■	■	■
Boolean					■	■	■	■
Digital inputs/outputs			■	■	■	■	■	■
High speed (100ms)						■	■	■
Disturbance (10msec)								■
Transient (1microsec)								CM4000T
Communications								
RS-485	■	PM710	■	■	■	■	■	■
RS-232								■
Onboard ethernet			Opt	Opt	Opt	Opt	Opt	Opt
Infrared port						Opt	Opt	Opt
I/O								
KYZ/KY output		PM700P	■	■	■	■	■	■
Digital inputs/outputs, (maximum)			(9)	(9)	(9)	(8)	(8)	(24)
Analogue inputs/outputs, (maximum)			(4)	(4)	(4)	(4)	(4)	(4)
Time stamping accuracy				1 sec	1 sec	1 ms	1 ms	1 ms
Event recording								
Steady state waveform capture						■	■	■
Disturbance WFC							■	■
Adaptive waveform capture								■
100ms event recordings							■	■
Metering characteristics								
Sampling rate, samples/cycle on 50Hz		32	64	64	64	128	128	512*
Voltage input range VAC		10-480	35-600	35-600	35-600	35-600	35-600	35-600
Accuracy of voltage/current reading		0.5%	0.1%	0.1%	0.1%	0.075%	0.075%	0.04%
Control power (voltage range)								
VAC		110-415	90-600	90-600	90-600	90-305	90-305	90-305
VDC		125-250	100-300	100-300	100-300	100-300	100-300	100-300
Standards compliance								
Accuracy IEC class		1	1	0.5	0.5	0.5	0.5	0.2
Accuracy ANSI 12.20		■	■	■	■	■	■	■
Emissions FCC part 15 class A/CE		■	■	■	■	■	■	■
CE marking	■	■	■	■	■	■	■	■
Other								
Onboard HTML web page server						Opt	Opt	Opt
Programmable logic								Opt
Register based event log						■	■	■
Downloadable firmware			■	■	■	■	■	■
Math and logic functions								■
Panel mounting			■	■	■	■	■	■
DIN rail mounting	■		■	■	■	■	■	

* CM4000T has a sampling rate of 83,333 samples/cycle

** Provides individual readings per circuit for I, kW, kVA, kVAR and kWHR with common readings per unit for V and F

PowerLogic

Multi-circuit metering

The metering of multiple circuits is more and more common place in various applications, increased since the introduction of the building regulations part L2 as part of the climate change program introduced as UK legislation.

The branch power meter provides a cost effective solution for single phase electrical load management making it ideally suited for applications where load capacity requirements are dynamic such as growing data centre and telecommunications industries.

PowerLogic:

Branch power meter

The branch current monitoring system provides a cost effective solution for electrical load management, making it ideally suited for applications where load capacity requirements are dynamic, such as power distribution units (PDU's) for the data centre industry.

The branch power meter reports the current level and power of each outgoing circuit from a panelboard or PDU providing preventative maintenance and consumption information on the users desktop PC. As a circuit approaches capacity, an alarm is generated, allowing additional capacity to be added to the system preventing down time resulting from overloaded circuits.

The branch power meter is available in two formats

- Solid core CT 'strips' for new build applications

  Two current sensing strips, each containing twelve current sensors, mount adjacent to the outgoing ways of the panel board. The two strips are connected to a data acquisition board equipped with a RS-485 Modbus communications port for remote access

- Split core individual CT's for retro-fit applications

  The same acquisition board is used but with split core CT's allowing convenient location for each unique application. Each split core CT is connected to the data acquisition board via a flying lead supplied

Applications

- Energy and load management
- Energy cost allocation
- Overload monitoring

Characteristics

- DIN rail mounting current transformers (CT's) installing quickly and easily
- Fewer components reducing installation time
- Field selectable address, baud rate and parity
- Daisy chain upto 63 units
- +/- 1% system accuracy

Description	Part number
Branch power meter c/w 2 solid core CT strips	**BPM**
Branch power meter c/w split core CT's	**BPMSC**

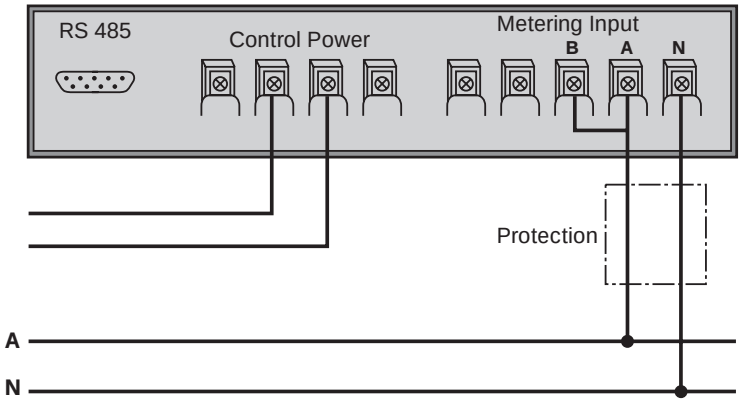
PowerLogic:

Branch power meter

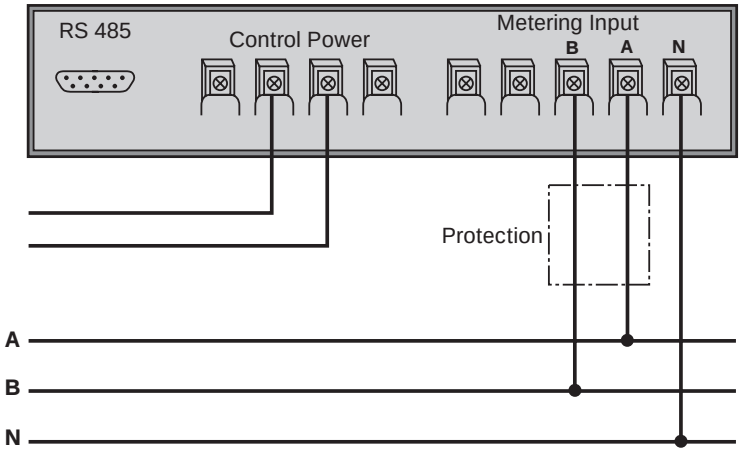
Specifications	
Operating temperature range	0 to 60°C (<95%RH non-condensing)
Storage temperature range	-40°C to 70°C
Power source	240 VAC (+10V-10%) line to neutral 50Hz
Measured current inputs	
Number of channels	24
Frequency	50Hz
Sample frequency	1280Hz
Update rate	1.2 sec
Accuracy	+/- 1% of reading 2A to 32A
Network communications	
Type	Modbus RTU
Connection	DIP switch selectable 2 wire or 4 wire
Address	DIP switch selectable address 1 to 247
Baud rate	DIP switch selectable 2400, 4800, 9600, 19200
Parity	DIP switch selectable none, odd, even
Communication format	8 data bits, 1 start bit, 1 stop bit
Termination	9 pin sub D connector TX+TX-shield TX+/RX+TX-/RX-
Defaults	
Warning alarm register	60% of current setting (configurable)
Critical alarm register	30% of current setting (configurable)
Current settings	20A (configurable from 10 - 50A)
Dimensions (mm)	
Circuit boards	BPM
Strips	502 x 34 x 49
Mainboard	408 x 262 x 95
Sensor spacing	36 on centre
Hole opening	10

Branch power meter connection details

- Monitor up to 24 circuits on 1 phase

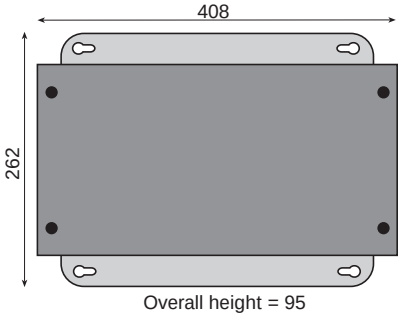


- Monitor up to 12 circuits on 2 phases

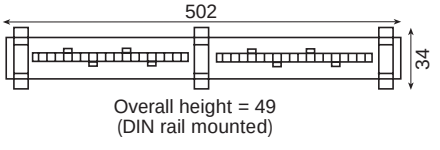


Branch power meter connection dimensions (mm)

- Data acquisition board



- Solid core CT strip



PowerLogic

Power metering

The **Power**Logic range features an extensive range of panel mounting power meters offering a number of advantages over traditional analogue meters.

All power meters within the **Power**Logic range are cost effective, high performance metering devices that can operate as stand alone devices or as part of an overall **Power**Logic system.

PowerLogic:

Power meter series PM700

The Power Logic **power meter series 700 is an inexpensive and compact 96 x 96 mm unit that offers all the basic measurement capabilities required to monitor an electrical installation. With its large easy-to-read display, the meter can display all three phases and neutral at the same time. The anti-glare and scratch resistant display features an intuitive interface with self-guiding menus. A unique green back light and large numbers make it easy to read even in extreme lighting conditions and viewing angles.**

The PM700 product offering consists of three models, each with an integrated display and providing metering measurements including THD and min/max values. The unit models include a basic metering unit, a unit with an RS 485 Modbus communication port, or a unit with 2 pulse outputs.

Applications

- Panel instrumentation
- Submetering and cost allocation
- Remote monitoring of an electrical installation
- Harmonic monitoring (THD)
- Contract optimisation and load profiling

Characteristics

Large, easy-to-read display
- Multiple values displayed at the same time on an anti-glare display featuring a green back-light

Easy to operate
- Intuitive navigation with context-sensitive menus for easy use

Only 50mm deep
- Measures 96 x 96 x 50 mm including connectors and Modbus communications

Energy class 1 as defined by IEC 61036
- Sufficient accuracy for submetering and cost allocation

Power, current demand, THD, min/max
- Expanded metering data for the cost of analog metering

Description	Part number
PM700/700P/710	
Power Meter with THD, min/max	**PM700MG**
Power Meter with THD, min/max, 2 pulse outputs	**PM700PMG**
Power Meter with THD, min/max, RS 485 communications	**PM710MG**

PowerLogic:

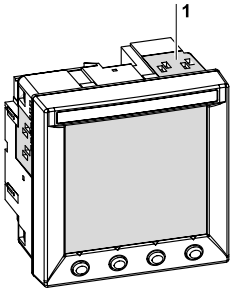
Power meter series PM700

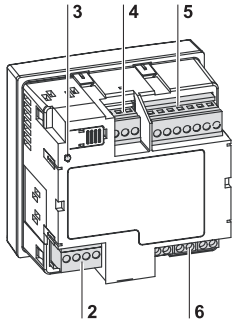
PM700 series back view

Electrical characteristics			
Type of measurement			True rms up to the 15th harmonic On three-phase AC system (3P 3P + N) 32 samples per cycle
Measurement accuracy	Current and voltage		0.5 %
	Power		1 %
	Frequency		± 0.01 Hz from 45 to 65 Hz
	Real Energy		IEC 61036 Class 1
	Reactive Energy		IEC 61036 Class 2
Data update rate			1 s
Input-voltage characteristics	Measured voltage		10 to 480 V AC (direct L-L)
			10 to 277 V AC (direct L-N)
			0 to 3.2 MV AC (with external VT)
	Metering over-range		1.2 Un
	Impedance		2 MΩ (L-L) / 1 MΩ (L-N)
	Frequency range		45 to 65 Hz
Input-current characteristics	CT ratings	Primary	Adjustable from 5A to 65534 A
		Secondary	5 A starting at 10 mA
	Measurement input range		0 to 6 A
	Permissible overload		15 A continuous
			50 A for 10 seconds per hour
			120 A for 1 second per hour
	Impedance		< 0.1 Ω
	Load		< 0.15 VA
Control Power	AC		110 to 415 ±10 % V AC, 5 VA
	DC		125 to 250 ±20 % V DC, 3 W
	Ride-through time		100 ms at 120 V AC
Output	Pulse output		PM700P Static output (240 ±10 % V AC or 300 ± 10% V DC, 100 mA max. @ 25 °C, derate 0.56 mA per °C above 25°C) 2.41 kV rms isolation
Mechanical characteristics			
	Weight		0.37 kg
IP degree of protection (IEC 60529)			IP52 front display, IP30 meter body
Dimensions			96 x 96 x 88 mm (meter with display)
			96 x 96 x 50 mm (behind mounting surface)
Environmental conditions			
Operating temperature	Meter		-0 °C to +60 °C
	Display		-10 °C to +50 °C
Storage temp.	Meter + display		-40 °C to +85 °C
Humidity rating			5 to 95 % RH at 50 °C (non-condensing)
Pollution degree			2
Metering category			III, for distribution systems up to 277 V L-N / 480 V AC L-L
Dielectric withstand			As per EN61010, UL508
Electromagnetic compatibility			
Electrostatic discharge			Level III (IEC 61000-4-2)
Immunity to radiated fields			Level III (IEC 61000-4-3)
Immunity to fast transients			Level III (IEC 61000-4-4)
Immunity to impulse waves			Level III (IEC 61000-4-5)
Conducted immunity			Level III (IEC 61000-4-6)
Immunity to magnetic fields			Level III (IEC 61000-4-8)
Immunity to voltage dips			Level III (IEC 61000-4-11)
Conducted and radiated emissions			CE commercial environment/FCC part 15 class B EN55011
Harmonics emissions			IEC 61000-3-2
Flicker emissions			IEC 61000-3-3
Safety			
Europe			CE, as per IEC 61010-1
U.S. and Canada			UL508
Communication			
RS 485 port 2-wire, up to 19200 bauds, Modbus RTU			
Firmware characteristics			
Min./max.			Worst min. and max. with phase indication for voltages, currents, voltage unbalance, and THD. Min. and max. values for power factor (True and Displacement), power (P, Q, S) and frequency
Firmware update			Update via the communication ports
Display characteristics			
Dimensions 73 x 69mm			Back-lit green LCD (6 lines total, 4 concurrent values)

PowerLogic:

Power meter series PM700





1 Mounting slots

2 RS485 communications (450C) or 2 pulse outputs (450P)

3 Heartbeat LED

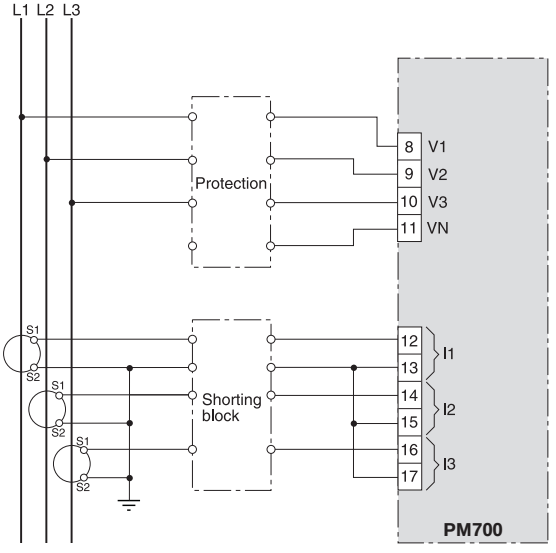
4 Control power

5 Voltage inputs

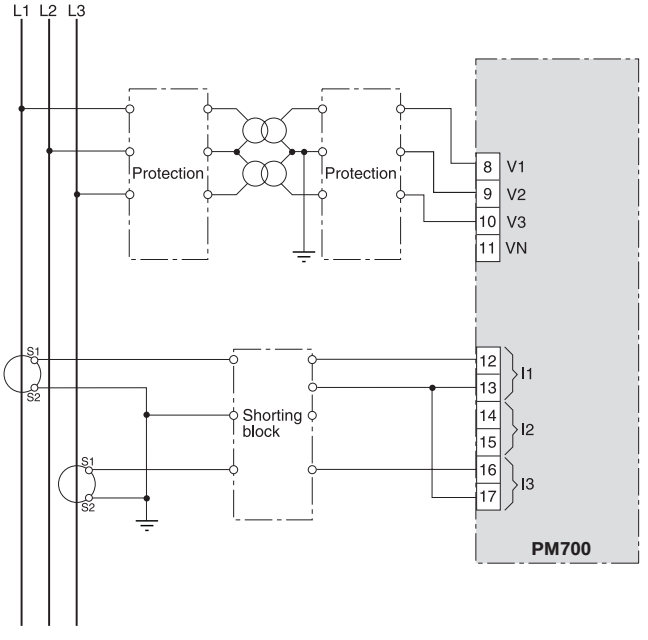
6 Current inputs

Selection guide		PM700	PM710	PM700P
General				
Use on LV and HV systems		■	■	■
Current and voltage accuracy		0.5%	0.5%	0.5%
Energy and power accuracy		1.0%	1.0%	1.0%
Instantaneous rms values				
Current, voltage, frequency		■	■	■
Active, reactive, apparent power	Total and per phase	■	■	■
Power factor	Total	■	■	■
Energy values				
Active, reactive, apparent energy		■	■	■
Demand values				
Current	Present and max.	■	■	■
Active, reactive, apparent power	Present and max.	■	■	■
Setting of calculation mode	Block, sliding block, rolling block	■	■	■
Data recording				
Min/max of instantaneous values		■	■	■
Display and I/O				
Backlit LCD Display		■	■	■
Pulse output		-	-	2
Communication				
RS 485 port		-	2 wire	-
Modbus protocol		-	■	-

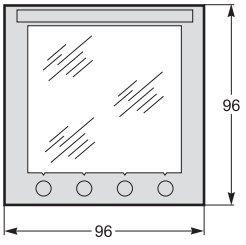
4 wire connection with 3 CT's and no VT

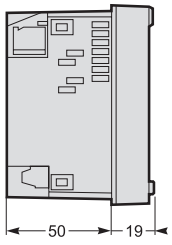


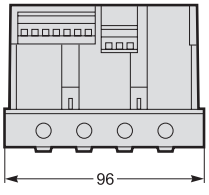
3 wire connection with 2 CT's and 2 VT's



Series PM700 dimensions

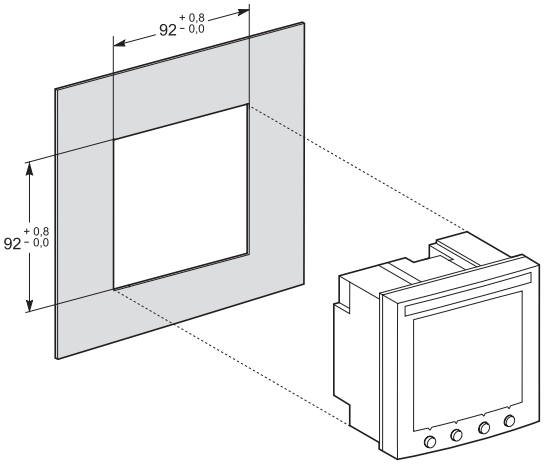






Dimension in mm

Front panel mounting



Dimension in mm

PowerLogic:

Power meter series PM800

The Power Logic **PM800 series is a high performance power monitoring unit, providing all the measurement capabilities required to monitor an electrical installation in a single 96 x 96 mm unit. With its large, easy-to-read display, you can monitor all three phases and neutral at the same time. In addition, the anti-glare and scratch resistant display features an intuitive interface with self guiding menus.**

Even in extreme lighting conditions or viewing angles, the display is easy to read due to a unique, white back light and large digits. The PM800 series features as standard an RS485 communication port, 1 digital input, 1 digital output, THD, and alarming in the base unit. In addition to these capabilities, the PM820 and PM850 offer custom onboard logging and individual harmonic values for current and voltage. The PM850 is the first meter in this range to offer waveform captures.

Applications

- Panel instrumentation
- Sub-billing/cost allocation/bill checking
- Remote monitoring of an electrical installation
- Basic power quality monitoring
- Contract optimisation and load curves

Characteristics

Large, easy-to-read back lit display
- Multiple values displayed at the same time on an anti-glare and white back light display

Easy to operate
- Intuitive navigation with self-guided menus makes it easy to use

High functionality in a compact size
- Integrates Modbus communications and I/O in a reduced case (96x96x70mm)

Harmonics analysis
- Monitor individual harmonic magnitudes and angles to troubleshoot your system

On-board memory
- Store in non-volatile memory critical information for billing and troubleshooting

IEC60687 class 0.5S or IEC61036 class 1 for energy
- Sub-metering and cost allocation in 4 quadrants

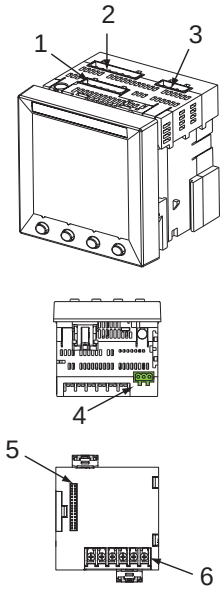
Modular and upgradeable
- Downloadable firmware and optional modules enable to grow the meter capability

Trend curves and short-term forecasting
- Rapid trending and forecasting of upcoming values for better decision making

Description	Part number
PM810 power meter with THD, alarming	**PM810MG**
PM820 power meter with harmonics, alarming, 80 kb logging	**PM820MG**
PM850 power meter with harmonics, alarming, 800 kb logging, waveform capture	**PM850MG**
Options and accessories	
2 relay outputs, 2 digital inputs	**PM8M22**
2 relay outputs, 6 digital inputs	**PM8M26**
2 relay outputs, 2 digital inputs, 2 analogue outputs, 2 analogue inputs	**PM8M2222**
PM810 logging, non volatile clock and harmonics module	**PM810MLOG**

PowerLogic:

Power meter series PM800



1 Control power supply connector
2 Voltage inputs
3 Digital input/output
4 RS485 port
5 Option module connector
6 Current inputs

Selection guide		PM810	PM820	PM850
General				
Use on LV and HV systems		■	■	■
Current and voltage accuracy		0.1%	0.1%	0.1%
Energy and power accuracy		1%	0.5%	0.5%
Number of samples per cycle		128	128	128
Instantaneous rms values				
Current, voltage, frequency		■	■	■
Active, reactive, apparent power	Total and per phase	■	■	■
Power factor	Total and per phase	■	■	■
Energy values				
Active, reactive, apparent energy		■	■	■
Settable accumulation mode		■	■	■
Demand values				
Current	Present and min./ max. values	■	■	■
Active, reactive, apparent power	Present and min./ max. values	■	■	■
Predicted active, reactive, apparent power		■	■	■
Synchronisation of the measurement window		■	■	■
Setting of calculation mode	Block, sliding	■	■	■
Power quality measurements				
Harmonic distortion	Current and voltage	■	■	■
Individual harmonics		With option PM810MLOG	31	63
Waveform capture				
Data recording				
Min/max of instantaneous values		■	■	■
Data logs		With option PM810MLOG	2	4
Event logs			■	■
Trending/forecasting				■
Alarms		■	■	■
Time stamping		With option PM810MLOG	■	■
Display and I/O				
White backlit LCD Display		■	■	■
Multilingual: English, French, Spanish		■	■	■
Digital input		1	1	1
Digital output or pulse output		1	1	1
Communication				
RS485 port		2 wire	2 wire	2 wire
Modbus protocol		■	■	■

PowerLogic:

Power meter series PM800

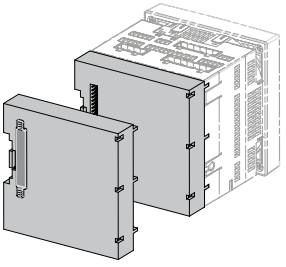
PM800 series back view

Electrical characteristics			
Type of measurement			True rms up to the 63rd harmonic On three-phase AC system (3PH, 3PH+N) 128 samples per cycle
Measurement accuracy	Current and voltage		±0.075% of reading + ±0.025% of full scale
	Power		±0.015% of reading + ±0.025% of full scale
	Frequency		±0.01 Hz from 45 to 67 Hz
	Energy	PM810	±0.01 Hz from 350 to 450 Hz
		PM820 and	IEC 61036 Class 1
		PM850	IEC 60687 & ANSI C12.20 Class 0.5S
Data update rate			1s
Input-voltage characteristics	Measured voltage		0 to 600 V AC (direct L-L) 0 to 347 V AC (direct L-N) 0 to 3.2 MV AC (with external VT)
	Metering over-range		1.5 Un
	Impedance		2 MΩ L-L / 1 MΩ L-N
	Frequency measurement range		45 to 67 Hz and 350 to 450 Hz
Input-current characteristics	CT ratings	Primary	Adjustable from 5A to 327 kA
		Secondary	1A or 5 A
	Measurement input range		0 to 10 A
	Permissible overload		15 A continuous 50 A for 10 seconds per hour 500 A for 1 second per hour
	Impedance		< 0.1 Ω
	Load		< 0.15 VA
Control Power	AC		100 to 415 ±10 % V AC, 11 VA
	DC		125 to 250 ±20 %V DC, 6 W
	Ride-through time		45 ms at 120 V AC
Input/outputs	Pulse output		Static output (6 to 220 ±10% V AC or 3 to 250 ±10 % V DC, 100 mA max. @ 25 °C) 1350 V rms isolation
	Status Input		1 digital input (24 to125 ±10 % V AC/DC), 5 mA max. burden
Mechanical characteristics			
Weight			0.6 kg
IP degree of protection (IEC 60529)			IP52 front display, IP30 meter body
Dimensions (mm)			96x96x88 (meter with display) 96x96x70 (behind mounting surface)
Environmental conditions			
Operating temperature	Meter		-25 °C to +70 °C (1)
	Display		-10 °C to +50 °C
Storage temperature	Meter + Display		-40 °C to +85 °C
Humidity rating			5 to 95 % RH at 40 °C (non-condensing)
Pollution degree			2
Metering category			III, for distribution systems up to 347 V L-N / 600 V AC L-L
Dielectric withstand			As per EN61010, UL508
Electromagnetic compatibility			Level III (IEC 61000-4-2)
Electrostatic discharge			Level III (IEC 61000-4-3)
Immunity to radiated fields			Level III (IEC 61000-4-4)
Immunity to fast transients			Level III (IEC 61000-4-5)
Immunity to impulse waves			Level III (IEC 61000-4-6)
Conducted immunity			Level III (IEC 61000-4-8)
Immunity to magnetic fields			Level III (IEC 61000-4-11)
Immunity to voltage dips			CE industrial environment/FCC part 15 class A
Conducted and radiated emissions			EN55011
Harmonics emissions			IEC 61000-3-2
Flicker emissions			IEC 61000-3-3

(1) 65 °C if control power is above 305 V AC

PowerLogic:

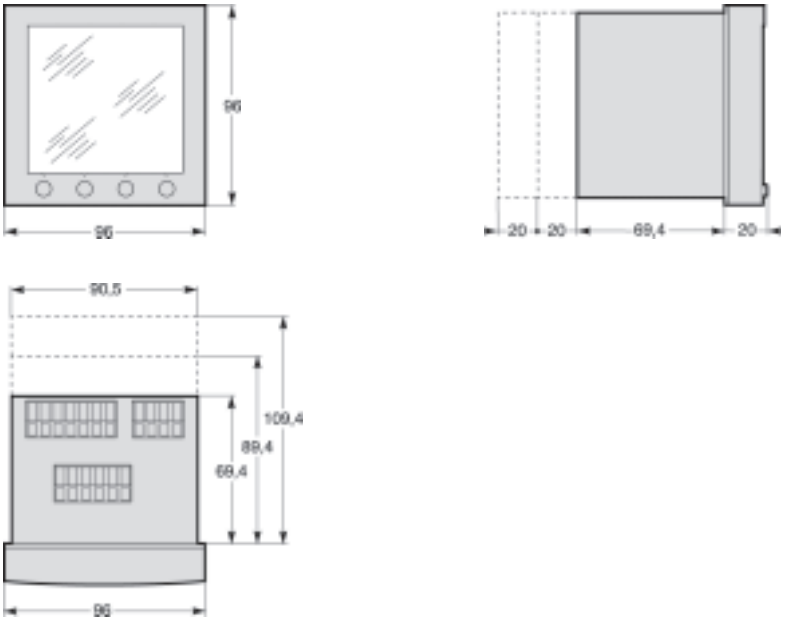
Power meter series PM800



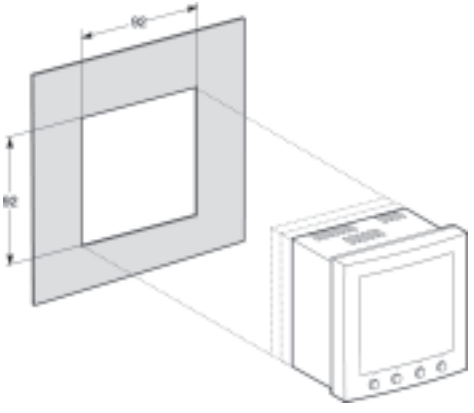
PM800 series with I/O module

Safety	
Europe	CE, as per IEC 61010
U.S. and Canada	UL508
Communication	
RS 485 port	2- wire, up to 38400 bauds, Modbus
Firmware characteristics	
Data logs	**PM820 and PM850** (Optional in PM810) 1 Billing log 1 Customisable log **PM850 only** 2 additional custom logs
Min./max.	Worst minimum and maximum with phase indication for voltages, currents, voltage unbalance, and THD. Minimum and maximum values for power factor (true and displacement), power (P, Q, S) and frequency
One event log	Time stamping to 1 second
Trend curves (PM850 only)	Four trend curves: 1 minute, 1 hour, 1 day and 1 month ■ every second for one minute for the 1-minute curve ■ every minute for one hour for the 1-hour curve ■ every hour for one day for the 1-day curve ■ every day for one month for the 1-month curve
Forecasting (PM850 only)	Forecasting of the values for the trended parameters for the next four hours and next four days
Waveform capture	Triggered manually or by alarm, 3-cycle, 128 samples/cycle on 6 user configurable channels
Alarms	■ adjustable pickup and dropout setpoints and time delays, numerous activation levels possible for a given type of alarm ■ four priority levels ■ response time: 1 second ■ Boolean combination of four alarms is possible using the operators NAND, OR, NOR and XOR on PM850 ■ Digital alarms, e.g. status change of digital inputs
Memory available for logging and waveform capture	80 kbytes in PM820 and PM810MLOG 800 kbytes in PM850
Firmware update	Update via the communication ports
Display characteristics	
73 x 69 mm	Back-lit white LCD (6 lines total, 4 concurrent values)
Languages	English, French, Spanish

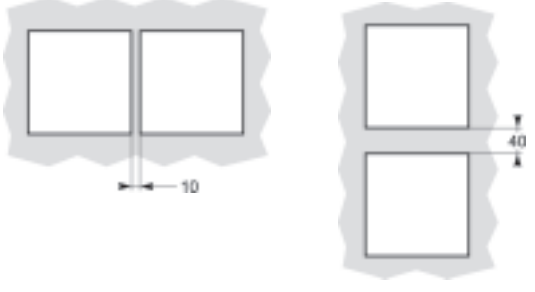
Power meter PM800



Front panel mounting

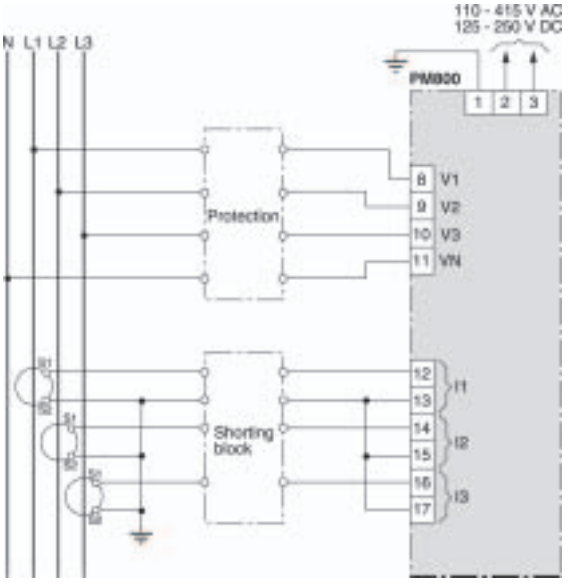


Clearances for multiple power meters

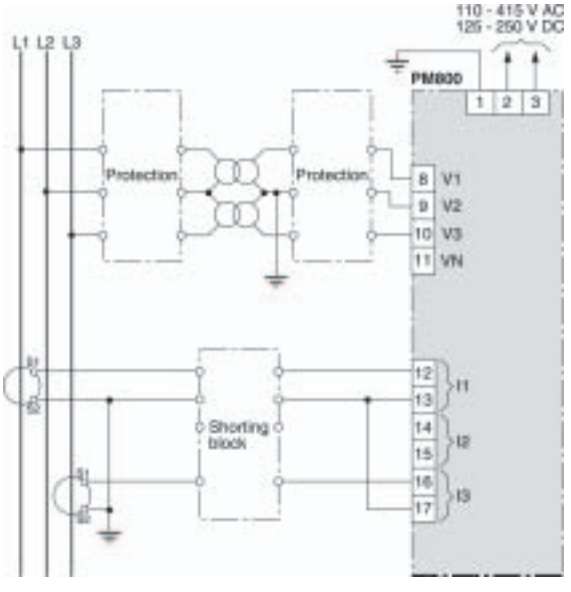


Dimensions in mm

3 phase 4 wire direct voltage input connection 3 CT's



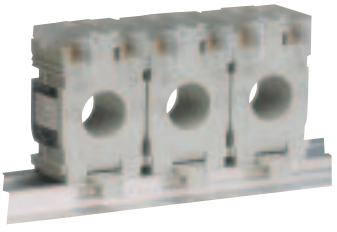
3 phase 3 wire 2 CT's 2 PT

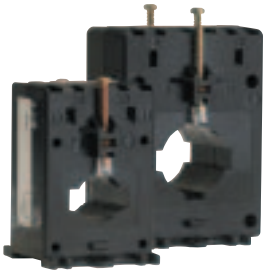


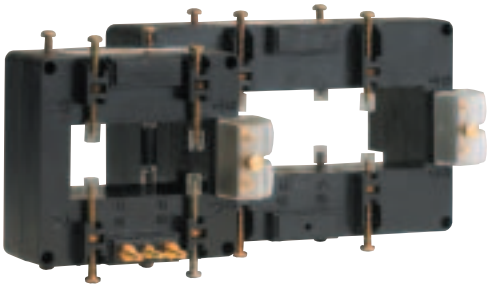
PowerLogic:

Current transformers

Current transformers for use with Power Logic **range of Power Meters and circuit monitors.**







Technical data

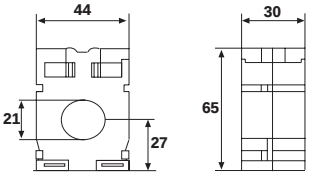
- Secondary current: 5A
- Maximum voltage rating Ue: 720V
- Frequency: 50 - 60Hz
- Permanent permissible overload: 1.2 In
- Safety factor
  - 40 to 4000A primary: Fs≤5
  - 5000, 6000A primary: Fs≤10
- IP20
- Ambient installation temperature
  - Standard range: -50°C to +55°C
  - Tropicalised range: -25°C to +60°C
- Relative humidity
  - Standard range: <95%
  - Tropicalised range: >95%
- Standards
  - Current transformers: BS7626, IEC44-1

PowerLogic:

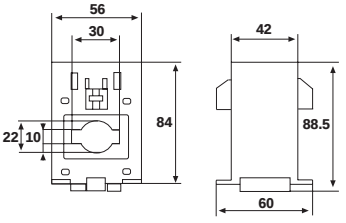
Current transformers

Ordering details								
			Current transformer aperture mm		CT output	VA		Weight
Ratio	Cat no. standard	Cat no. tropicalised	circular diameter	Maximum busbar size	Class 0.5	Class 1	Class 3	kg
40/5		**16500**	21	20 x 5			1	0.20
50/5	**16501**	**16451**	21	20 x 5		1.25	1.5	0.20
75/5	**16502**	**16452**	21	20 x 5		1.5	3	0.20
100/5	**16503**	**16453**	21	20 x 5	2	2.5	4	0.20
125/5	**16504**	**16454**	21	20 x 5	2.5	4	5	0.20
150/5	**16505**	**16455**	21	20 x 5	3	4	6.5	0.20
	16509	**16459**	22	30 x 10	1.5	5.5	6.5	0.27
200/5	**16506**	**16456**	21	20 x 5	4	6	7	0.20
	16510	**16460**	22	30 x 10	4	7	8.5	0.27
	16526	**16476**		65 x 32		2	5	0.60
250/5	**16511**	**16461**	22	30 x 10	6	9	11	0.27
	16518	**16468**	33	40 x 10	2.5	5	8	0.43
	16527	**16477**		65 x 32	1	4	6	0.60
300/5	**16512**	**16462**	22	30 x 10	7.5	11	13.5	0.27
	16519	**16469**	33	40 x 10	4	8	12	0.43
	16528	**16478**		65 x 32	1.5	6	7	0.60
400/5	**16513**	**16463**	22	30 x 10	10.5	15	18	0.27
	16520	**16470**	33	40 x 10	8	12	15	0.43
	16529	**16479**		65 x 32	5	7.5	10	0.60
500/5	**16514**	**16464**	22	30 x 10	12	18	22	0.27
	16521	**16471**	33	40 x 10	10	12	15	0.43
	16523	**16473**		51 x 31 or 64 x 11	2	4	6	0.50
	16530	**16480**		65 x 32	8	10	12	0.60
600/5	**16515**	**16465**	22	30 x 10	14.5	21.5	26	0.27
	16524	**16474**		51 x 31 or 64 x 11	4	6	8	0.50
	16531	**16481**		65 x 32	8	10	12	0.60
800/5	**16532**	**16482**		65 x 32	12.5	15	20	0.60
1000/5	**16533**	**16483**		65 x 32	15	20	25	0.60
1250/5		**16534**		65 x 32	20	25	30	0.60
		16537		84 x 34	12	15	20	0.70
		16540		127 x 38	8	12		1.50
1500/5		**16535**		65 x 32	22.5	30	35	0.60
		16538		84 x 34	15	20	25	0.70
		16541		127 x 38	10	15		1.50
2000/5		**16542**		127 x 38	15	20		1.50
2500/5		**16543**		127 x 38	20	25		1.50
		16545		127 x 52	40	50	60	1.50
3000/5		**16544**		127 x 38	25	30		1.50
4000/5		**16547**		127 x 52	60	80	100	1.50
5000/5		**16548**		165 x 55	60	120		5.00
6000/5		**16549**		165 x 55	70	120		5.00

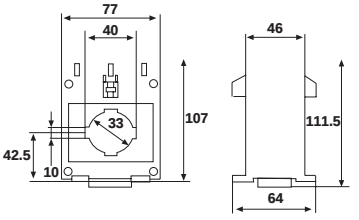
Part numbers 16500 to 16506 and 16451 to 16456



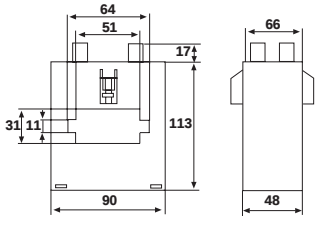
Part numbers 16509 to 16515 and 16459 to 16465



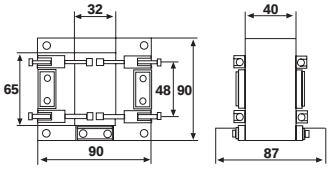
Part numbers 16518 to 16521 and 16468 to 16471



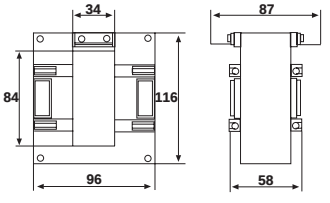
Part numbers 16523 to 16524 and 16473 to 16474



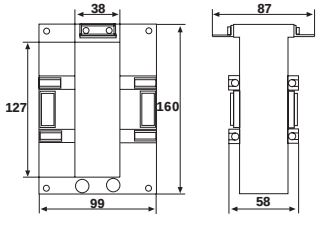
Part numbers 16526 to 16535 and 16476 to 16483



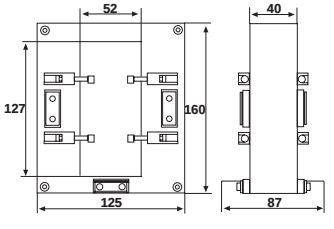
Part numbers 16537 to 16538



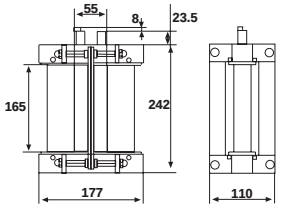
Part numbers 16540 to 16544



Part numbers 16545 to 16547



Part numbers 16548 to 16549



Dimensions in mm

PowerLogic

Circuit monitoring

The **Power**Logic range of circuit monitors offers multifunctional, digital instrumentation, data acquisition and control capable of replacing a variety of meters, relays, transducers and other components.

The **Power**Logic circuit monitor products install onto a three phase circuit like a conventional watt hour meter, but delivering far more information. The circuit monitors offer comprehensive metering with 0.04% typical accuracy on current and voltage.

PowerLogic:

Circuit monitor series 3000

Circuit monitor CM3250 and CM3350 are high performance acquisition and control devices offering numerous measurement functions. They integrate easily in power monitoring and control systems due to their optional ethernet connections and embedded web server.

Whether installed at the point of common coupling, at the head of a switchboard or on sensitive equipment feeders, circuit monitor units record the electrical parameters of the installation. They provide the information required to control costs, improve power quality and reduce equipment downtime.

The CM3350 detects and captures voltage sags and swells that may cause halts in production.

Applications

- Panel instrumentation
- Sub-billing/cost allocation
- Remote monitoring of an electrical installation
- Power quality monitoring
- Contract optimisation
- Bill checking

Characteristics

- IEC 60687 and ANSI C12.20 Class 0.5S for energy
- Trend curves and short term forecasting
- Detection and capture of voltage sags and swells (CM3350 only)
- Acquisition of rms values every 100 ms (CM3350 only)
- Ethernet 10/100 Mbits/s card (optional)
- Server for custom HTML pages (optional)
- Up to nine input/outputs to monitor the electrical installation (optional)
- 8 MB of memory

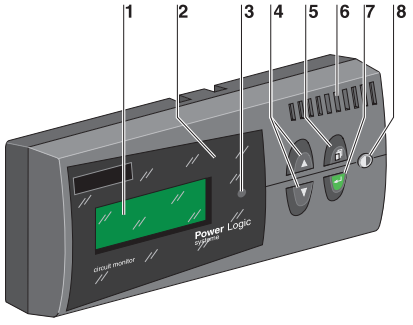
Description	Part number
Series 3000	
CM3250	**CM3250MG**
CM3350	**CM3350MG**

PowerLogic:

Circuit monitor series 3000

Selection guide		CM3250	CM3350
Current and voltage accuracy		0.1 %	0.1 %
Energy and power accuracy		0.5 %	0.5 %
Number of samples per cycle		128	128
Instantaneous rms values			
Current, voltage, frequency		■	■
Active, reactive, apparent power	Total and per phase	■	■
Power factor	Total and per phase	■	■
Energy values			
Active, reactive, apparent energy		■	■
Demand values			
Current	Present and max. values	■	■
Active, reactive, apparent power	Present and max. values	■	■
Predicted active, reactive, apparent power		■	■
Synchronisation of the measurement window		■	■
Power quality measurements			
Harmonic distortion	Current and voltage	■	■
Individual harmonics		63	63
Waveform capture		■	■
Detection of voltage sags and swells		-	■
Fast acquisition of 100 ms data		-	■
Data recording			
Min/max of instantaneous values		■	■
Data and event logs		■	■
Trending/forecasting		■	■
Alarms and SER (sequence of event recording)		■	■
GPS synchronisation (1 ms)		IOC44 option	
8 MB memory		■	■
Display and I/O			
Multilingual display		CMDLC or CMDVF option	
Pulse output		■	■
Maximum number of I/Os		9	9
Direct voltage connection		600 V	600 V
Communication			
RS485 Modbus port		2/4 wires	2/4 wires
Infrared Modbus port		CMDVF option	
Ethernet card + HTML page web server		ECC21 option	
Ethernet gateway for third party products		ECC21 option	

The CM3000 has two optional display units, an LCD display and a vacuum fluorescent display (VFD). They may be used for local circuit-monitor setup and operation.



1 Display screen
2 Infrared port (VFD display only)
3 Alarm LED
4 Arrow buttons
5 Menu button
6 Proximity sensor (VFD display only)
7 Enter button
8 Contrast button

CMDLC display

CMDLC display

Back lit LCD display with four lines and 20 characters per line. The display unit has four navigation buttons, a contrast button and a red alarm LED. It connects to the CM3000 via a CAB12 cable, 4.2 meters long, supplied with the display.

Description		Part number
LCD display supplied with the CAB12 cable		**CMDLCMG CMDLC**
Connection cables CM3000/CM3000T	1.3 m	**CAB4 CAB4**
<-> display	4.2 m	**CAB12 CAB12**
	9.0 m	**CAB30 CAB30**

CMDVF display

CMDVF display

Vacuum fluorescent display (VFD) with four lines and 20 characters per line. The display unit comprises four navigation buttons, a contrast button, a red alarm LED and an infrared port. The infrared port is used with the OCIVF accessory and may serve to set up or operate the circuit monitor from a computer. It connects to the CM3000 via a CAB12 cable, 4.2 meters long, supplied with the display.

Description		Part number
VFD display supplied with the CAB12 cable		**CMDVFMG CMDVF**
Connection cable CM3000/CM3000T	1.3 m	**CAB4 CAB4**
<-> display	4.2 m	**CAB12 CAB12**
	9.0 m	**CAB30 CAB30**

OCIVF optical communication interface

OC/VF optical communication interface

Accessory for transmission between the infrared port on the CMDVF display and a PC computer (with SMS software).

Description	Part number
Optical communication interface	**OCIVF**

Ethernet ECC21 communication card

Transparent Ready™
Web-enabled Power & Control

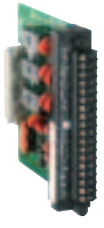
Ethernet ECC21 communication card

This optional card has two main functions:

- It provides the circuit monitor with a fast ethernet connection over a 10/100 Mbits/s copper link or a 100 Mbits/s Fibre optic link
- It serves as an ethernet gateway for devices daisy chained to its RS485 Modbus port

The card also includes a server for six HTML pages that may be consulted by a standard web browser. These pages may be customised and display information from the host circuit monitor and/or devices connected to its Modbus port.
The ECC21 card may be installed in the Circuit Monitor option-card slot.

Description	Part number
Ethernet communication card	**ECC21**



IOC44 card

IOC44 input/output card

Input/output blocks may be added to the circuit monitor to:

- Monitor the electrical installation, notably the status of the circuit breakers, and check discrimination between protection devices
- Measure the consumption of other commodities by counting the pulses sent by water or gas meters
- Measure the temperature of the transformers
- Transmit parameters over analogue channels to other systems

This optional card provides:

- 4 digital inputs (20 - 138 VAC/DC)
- 4 digital outputs, including 3 relay outputs and a static output that may be programmed as a pulse output

Status changes on the digital inputs are time-stamped to within 1 ms.

The IOC44 card may be installed in the Circuit Monitor option-card slot to:

- Monitor the electrical installation, notably the status of the circuit breakers, and check discrimination between protection devices
- Measure the consumption of other commodities by counting the pulses sent by water or gas meters

Description	Part number
IOC44 card	**IOC44**

PowerLogic:

Circuit monitor series 3000

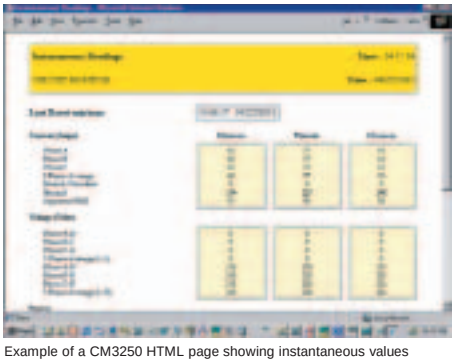
Electrical characteristics		
Type of measurement		True rms up to the 63rd harmonic On three-phase AC system (3P, 3P+N) 128 samples per cycle
Measurement accuracy	Current and voltage	±0.075 % of reading + ±0.025 % of full scale
	Power	±0.075 % of reading + ±0.025 % of full scale
	Frequency	±0.01 Hz from 45 to 67 Hz ±0.01 Hz from 350 to 450 Hz
	Energy	IEC 60687 and ANSI C12.20 Class 0.5S
Data update rate		1 s in normal mode and 100 ms in 100 ms mode
Input voltage characteristics	Measured voltage	0 to 600 V AC (direct) 0 to 1200 kV AC (with external VT)
	Measurement range	0 to 1.5 Un
	Impedance	> 2 MΩ
	Frequency	
	Measurement range	45 to 67 Hz and 350 to 450 Hz
Input current characteristics	CT ratings	Adjustable from 5 A to 30 000 A
	Measurement range	0 to 2 In
	Permissible overload	15 A continuous 50 A for 10 seconds per hour 500 A for 1 second per hour
	Impedance	< 0.1 Ω
	Load	< 0.15 VA
Supply	AC	90 to 305 V AC, 27 VA
	DC	100 to 300 V DC, 16 W
	Ride through time	99 ms at 120 V AC/75 ms at 125 V DC
Input/outputs	Pulse output	Static output (240 V AC max., 100 mA max.)
	IOC44 card (optional)	4 digital inputs (20-138 V AC/DC), 3 relay outputs (5 A to 240 V AC) 1 static output (96 mA max. at 240 V AC)

Series 3000 + optional ECC21 or IOC44

Mechanical characteristics		
Weight		1.1 kg
IP degree of protection (IEC 60529)		IP52
Dimensions (mm)		CM3250/3350 210 x 105 x 143
Environmental conditions		
Operating temperature	CM3250/CM3350	-25 °C to +70 °C
	CMDLC display	-20 °C to +60 °C
	CMDVF display	-20 °C to +70 °C
Storage temperature	CM + displays	-40 °C to +85 °C
Humidity rating		5 to 95% RH at 40 °C
Pollution degree		2
Installation category		III, for distribution systems up to 277/480 V (1)
Dielectric withstand		As per EN61010, UL508
Electromagnetic compatibility		
Electrostatic discharge		Level 3 (IEC 61000-4-2)
Immunity to radiated fields		Level 3 (IEC 61000-4-3)
Immunity to fast transients		Level 3 (IEC 61000-4-4)
Immunity to impulse waves		Level 3 (IEC 61000-4-5)
Conducted and radiated emissions		CE industrial environ./FCC part 15 class A EN55011
Safety		
Europe		CE, as per IEC 61010
U.S. and Canada		UL508
Communication		
RS485 port (2)		2/4 wires, up to 38400 bauds, Modbus
Infrared port (optional) (2)		IrDa, up to 38400 bauds, Modbus
Ethernet ECC21 card with HTML server (optional) (2)		
Copper ethernet link		10/100 BaseTX, RJ45 connector, 100-metre link
Fibre-optic ethernet link		100 Base FX, LC duplex connector, 1300 nm, FO multimode with gradient index 62.5/125 µm or 50/125 µm, 2000-metre link
Protocol		Modbus/TCP/IP
Gateway function for products connected to the ECC21		Master Modbus port, 31 daisy-chained slaves, 63 with repeater, 2/4 wires, 1200 to 38400 bauds, also compatible with the **Power**Logic protocol
HTML server		1 standard page, 5 customisable pages

(1) Category II for distribution systems higher than 277/480 V.

(2) All the communication ports may be used simultaneously.



Example of a CM3250 HTML page showing instantaneous values

Ethernet ECC21 card with HTML server (optional) (2)	
Copper ethernet link	10/100 BaseTX, RJ45 connector, 100-metre link
Fibre-optic ethernet link	100 Base FX, LC duplex connector, 1300 nm, FO multimode with gradient index 62.5/125 µm or 50/125 µm, 2000-metre link
Protocol	Modbus/TCP/IP
Gateway function for products connected to the ECC21	Master Modbus port, 31 daisy-chained slaves, 63 with repeater, 2/4 wires, 1200 to 38400 bauds, also compatible with the **Power**Logic protocol
HTML server	1 standard page, 5 customisable pages

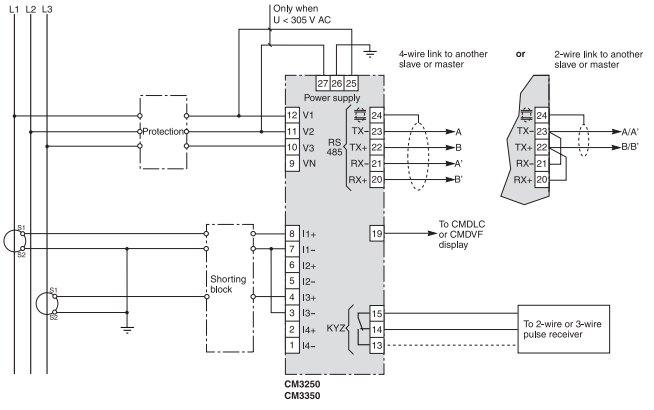
Firmware characteristics	
14 data logs	Up to 96 different parameters, factory-set logs ready to use
One 100 ms data log	Parameters recorded every 100 ms for events (CM3350 only)
One min./max. log	-
One min./max./avg. log	Min./max./avg. values recorded for 23 parameters at regular intervals from 1 to 1440 minutes
One event log	Time stamping to 1 ms, synchronisation 1 ms by GPS
Trend curves	Four trend curves: 1 minute, 1 hour, 1 day and 1 month. Min./max./avg. values recorded for eight parameters: ■ Every second for one minute for the 1-minute curve ■ Every minute for one hour for the 1-hour curve ■ Every hour for one day for the 1-day curve ■ Every day for one month for the 1-month curve
Forecasting	Forecasting of the values for the eight parameters for the next four hours and next four days
Waveform capture	Standard: manual launch, 1 cycle, 128 samples, 63rd harmonic Disturbance: manual launch or by alarm, 128 samples per cycle, adjustable from 12 to 80 cycles, response time less than 0.5 cycle, number of cycles before alarm settable from 2 to 10
Alarms	Adjustable pickup and dropout setpoints and time delays, numerous activation levels possible for a given type of alarm. Four priority levels, three response times: standard 1 second, fast 100 ms, disturbance < 0.5 cycle (CM3350 only) Boolean combination of four alarms is possible using the operators NAND, OR, NOR and XOR Digital alarms, e.g. status change of digital inputs
Memory	8 MB standard
Firmware update	Update via the communication ports

Display characteristics	
CMDLC (optional)	Back-lit LCD
CMDVF (optional)	Vacuum fluorescent display (VFD) with IR port
Languages	French, English, Spanish

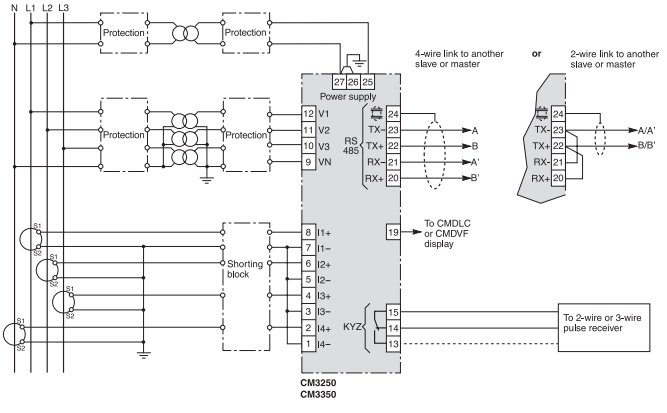
(1) Category II for distribution systems higher than 277/480 V.

(2) All the communication ports may be used simultaneously.

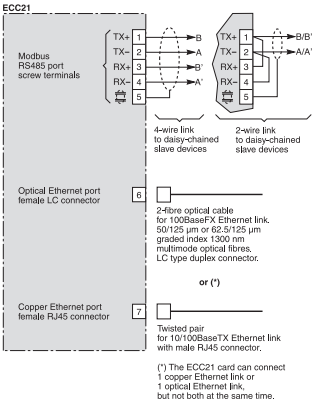
3 wire connection with 2 CT's and no VT



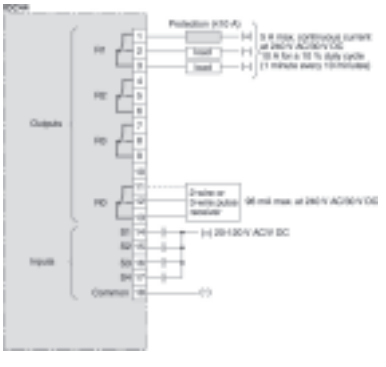
4 wire connection with 4 CT's and 3 VT's



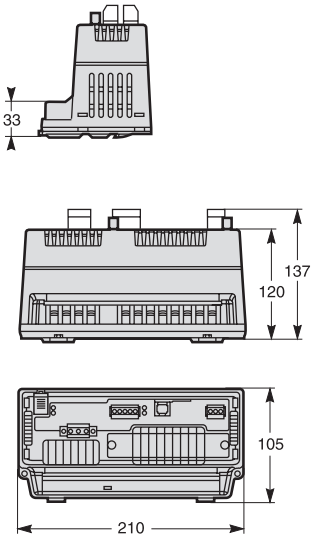
Ethernet ECC21 communication card


ECC21
Modbus RS485 port screw terminals
4-wire link to daisy-chained slave devices
2-wire link to daisy-chained slave devices
Optical Ethernet port female LC connector
2-fibre optical cable for 100BaseFX Ethernet link. 50/125 µm or 62.5/125 µm graded index 1300 nm multimode optical fibres, LC type duplex connector.
or (*)
Copper Ethernet port female RJ45 connector
Twisted pair for 10/100BaseTX Ethernet link with male RJ45 connector.
(*) The ECC21 card can connect 1 copper Ethernet link or 1 optical Ethernet link, but not both at the same time.

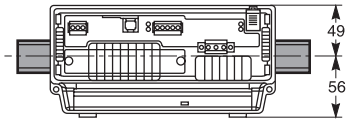
IOC44 input/output card



CM3000

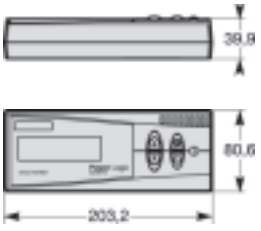


Mounting on symmetrical rail

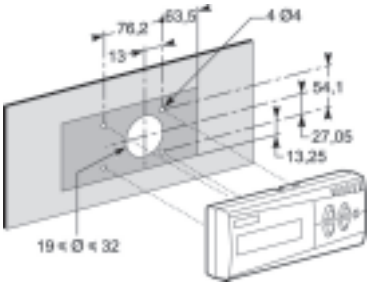


Dimensions in mm

CMDLC/CMDVF



Mounting on a back plate



Dimensions in mm

PowerLogic:

Circuit monitor series 4000

The CM4000 and CM4000T are high performance, digital instrumentation, data acquisition and control devices offering numerous measurement functions and easy integration due to their ethernet connections and embedded web server. They are designed for applications where power quality and availability are critical factors.

They are generally used at the service entrance and for sensitive equipment mains. Due to the very wide range of functions, including the detection of transients, it is possible to rapidly solve the problems arising from poor power quality. They are also extremely useful in handling the situations generated by the deregulation of markets. As metering class products, they can also be used to measure the consumption of other commodities such as water, gas or vapour.

CCM4000 + vacuum fluorescent display (VFD)

Applications

- Panel instrumentation
- Sub-billing/cost allocation
- Real time monitoring
- Extensive power quality monitoring
- Contract optimisation
- Bill checking
- Preventive maintenance

Characteristics

IEC 60687 and ANSI C12.20 Class 0.2 for energy and power
- Verification of consumption and load curves

Detection and capture of voltage sags and swells
- Rapid identification of the underlying causes of problems

Detection and capture of short transients less tha 1 µs (optional)
- Identification of problems due to short disturbances, e.g. switching of capacitors, etc

Adaptive waveform capture
- Adjustable or self-adjusting recording times for the capture of long phenomena, e.g. motor starts, reconnection sequences, etc

Acquisition of rms values every 100 ms
- Preventive maintenance, e.g. acquisition of a motor start-up curve, etc

Connections to fast ethernet networks 10/100 Mbits/s (optional)
- Rapid data transfers over an intranet or the internet

Server for custom HTML pages (optional)
- Access to the information without any special tools, simply a web browser

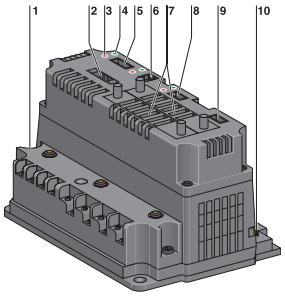
Up to 25 inputs/outputs to monitor the electrical installation
- Status of circuit breakers, as well as metering of other commodities, e.g. gas, water, etc

Up to 32 MB of memory
- For archiving of data and waveforms

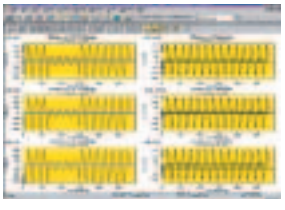
Description	Part number
CM4000	**CM4000MG**
CM4000T	**CM4000TMG**

PowerLogic:

Circuit monitor series 4000



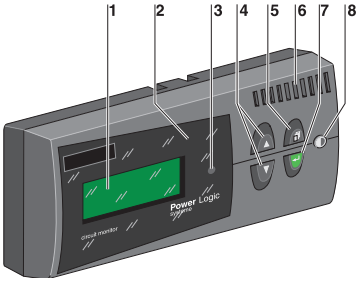
1 Current/voltage module
2 Control power-supply connector
3 Maintenance LED indicator
4 Power LED indicator
5 RS485 port with transmit and receive LED indicators
6 Display communication port
7 Slots for optional cards
8 RS232 port with transmit and receive LED indicators
9 KYZ pulse output
10 Sealable access door



Disturbance waveform capture: detection of a voltage sag

Selection guide		CM4000	CM4000T
General			
Use on LV and HV systems		■	■
Current and voltage accuracy		0.04%	0.04%
Energy and power accuracy		0.2%	0.2%
Nbr of samples/cycle or sample frequency		512	5 MHz
Instantaneous rms values			
Current, voltage, frequency		■	■
Active, reactive, apparent power	Total and per phase	■	■
Power factor	Total and per phase	■	■
Energy values			
Active, reactive, apparent energy		■	■
Settable accumulation mode		■	■
Demand values			
Current	Present and max. values	■	■
Active, reactive, apparent power	Present and max. values	■	■
Predicted active, reactive, apparent power		■	■
Synchronisation of the measurement window		■	■
Setting of calculation mode:	block, sliding	■	■
Power quality measurements			
Harmonic distortion	Current and voltage	■	■
Individual harmonics	Via meter	63	63
	Via SMS	255	255
Waveform capture		■	■
Detection of voltage swells and sags		■	■
Adaptive waveform capture (up to 64 s)		■	■
Detection and capture of transients (< 1 µs)		-	-
Fast acquisition of 100 ms data		■	■
Programmable (logic and math functions)		■	■
Data recording			
Min/max of instantaneous values		■	■
Data logs		■	■
Event logs		■	■
Alarms		■	■
SER (Sequence of Event Recording)		■	■
Time stamping		■	■
GPS synchronisation (1 ms)		■	■
Memory expandable up to		32MB	32MB
Display and I/O			
Display		CMDLC or CMDVF option	
Multilingual: English, French, Spanish		■	■
Wiring self-test		■	■
Pulse output		■	■
Maximum number of I/Os		25	25
Direct voltage connection		600V	600V
Communication			
RS485 port		2/4 wires	2/4 wires
Infrared port		CMDVF option	
RS232 port		■	■
Modbus protocol		■	■
Ethernet card (Modbus/TCP/IP protocol)		ECC21 option	
HTML-page web server		ECC21 option	
Ethernet gateway for third-party products		ECC21 option	

The CM4000 has two optional display units, an LCD display and a vacuum fluorescent display (VFD). They may be used for local circuit monitor setup and operation.



1 Display screen
2 Infrared port (VFD display only)
3 Alarm LED
4 Arrow buttons
5 Menu button
6 Proximity sensor (VFD display only)
7 Enter button
8 Contrast button

CMDLC display

Back lit LCD display with four lines and 20 characters per line. The display unit has four navigation buttons, a contrast button and a red alarm LED. It connects to the CM4000 via a CAB12 cable, 4.2 meters long, supplied with the display.

Description		Part number
LCD display supplied with the CAB12 cable		**CMDLCMG**
Connection cables CM4000/CM4000T	1.3 m	**CAB4**
<-> display	4.2 m	**CAB12**
	9.0 m	**CAB30**

CMDVF display

Vacuum fluorescent display (VFD) with four lines and 20 characters per line. The display unit comprises four navigation buttons, a contrast button, a red alarm LED and an infrared port. The infrared port is used with the OCIVF accessory and may serve to set up or operate the circuit monitor from a computer. It connects to the CM4000 via a CAB12 cable, 4.2 meters long, supplied with the display.

Description		Part number
LCD display supplied with the CAB12 cable		**CMDVFMG**
Connection cables CM4000/CM4000T	1.3 m	**CAB4**
<-> display	4.2 m	**CAB12**
	9.0 m	**CAB30**

OCIVF optical communication interface

Accessory for transmission between the infrared port on the CMDVF display and a PC computer (with SMS software).

Description	Part number
Optical communication interface	**OCIVF**

Transparent Ready™
Web-enabled Power & Control

Ethernet ECC21 communication card

The ECC21 is an optional ethernet communication card. It may be installed in one of the two slots in the circuit monitor intended for optional cards. It has two main functions:

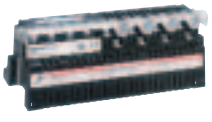
- Equip the circuit monitor with a fast ethernet connection over a 10/100 Mbits/s copper link or a 100 Mbits/s Fibre optic link
- Serve as an ethernet gateway for devices daisy chained to its RS485 Modbus port. The ECC21 card also includes a server for six HTML pages that may be consulted by a standard web browser. The pages may be customised and display information from the host circuit monitor and/or devices connected to its Modbus port.

Description	Part number
Ethernet communication card	**ECC21**

CVM current/voltage module

This is the CM4000 acquisition module for currents and voltages. It is supplied already installed on the CM4000. If the circuit monitor must be recalibrated, this is the only module requiring recalibration. It may be installed and removed in the field. This module may also be replaced in the field by a CVMT module (see the next paragraph) to transform a CM4000 into a CM4000T.

Description	Part number
Current/voltage module for CM4000	**CVM**



CVMT current/voltage module

This is the CM4000T acquisition module for currents and voltages, i.e. it is suitable for the detection of transient phenomena with a 5 MHz voltage sampling rate. Similar to the CVM, it may be installed and removed in the field. It is supplied already installed on the CM4000T.

Description	Part number
Current/voltage module for CM4000T	**CVMT**

Input/output blocks may be added to the circuit monitor to:

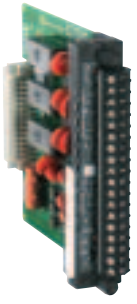
- Monitor the electrical installation, notably the status of the circuit breakers, and check discrimination between protection devices
- Measure the consumption of other commodities by counting the pulses sent by water or gas meters
- Measure the temperature of the transformers
- Transmit parameters over analogue channels to other systems

The circuit monitor may be equipped with a total of 25 optional digital or analogue input/outputs.

These input/outputs may be added in two different manners:

- Either using an IOC44 card
- Or the IOX input/output extender module and individual input/output modules that connect to the extender

All these options may be installed in the field. Status changes on the digital inputs are time-stamped to within the millisecond.



IOC44 card

This is an input/output card equipped with:

- 4 digital inputs 20 - 138 V AC/DC
- 4 digital outputs, including 3 relay outputs and a static output that may be programmed as a pulse output. It may be installed in the option card slots of the circuit monitor

There are three possible configurations for the circuit monitor series 4000:

- 1 IOC44 card
- 2 IOC44 cards
- 1 IOC44 card and 1 ethernet ECC21 card

Description	Part number
IOC44 card	**IOC44**

IOX extender equipped with two input/output modules

IOX input/output extender

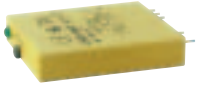
The IOX input/output extender may be equipped with up to eight plug-in input or output modules. The entire unit connects to the side of the circuit monitor. The input/output modules may be digital or analogue.

Three pre-equipped versions may be ordered directly, the IOX08, IOX0404 and IOX2411. Other versions may be user prepared by ordering an empty IOX extender and separate I/O modules (see the section on I/O Modules for selection). In this case, the IOX extender may be equipped with up to a maximum of four analogue modules.

Description	
IOX extender	Empty extender with eight slots for separate input and/or output modules, digital or analogue, with however a maximum of four analogue modules.
IOX08 extender	IOX extender equipped with: 8 digital input modules 120 V AC
IOX0404 extender	IOX extender equipped with: 4 digital input modules 120 V AC 4 analogue input modules 4-20 mA
IOX2411 extender	IOX extender equipped with: 2 digital output modules 60 V DC 4 digital input modules 32 V DC 1 analogue output module 4-20 mA 1 analogue input module 0-5 V

IOX2411 pre-equipped extender module

Description	Part number
IOX extender	**IOX**
IOX08 extender	**IOX08**
IOX0404 extender	**IOX0404**
IOX2411 extender	**IOX2411**



Input/output modules

The input/output modules are installed in the slots of the IOX extender. One module corresponds to either one input or one output. A number of versions are available, digital and analogue inputs and outputs, and different voltage levels.

Description	
DI120AC module	One digital input 120 V AC
DI240AC module	One digital input 240 V AC
DI32DC module	One polarised digital input 32 V DC, switching time 0.2 ms
DO120AC module	One digital output 120 V AC, 3.5 A max
DO240AC module	One digital output 240 V AC, 3.5 A max
DO200DC module	One digital output 200 V DC, 3.5 A max
DO60DC module	One digital output 60 V DC, 3.5 A max
AI05 module	One analogue input 0-5 V DC
AI420 module	One analogue input 4-20 mA
AO420 module	One analogue output 4-20 mA, max. load 250 Ω

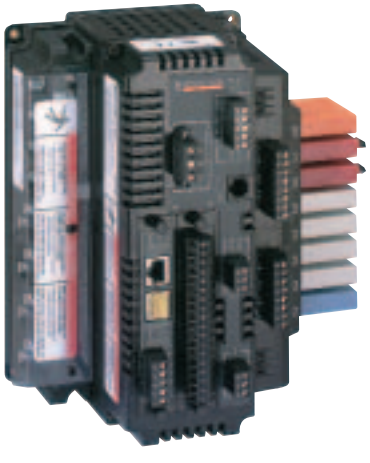
Description	Part number
DI120AC module	**DI120AC**
DI240AC module	**DI240AC**
DI32DC module	**DI32DC**
DO120AC module	**DO120AC**
DO240AC module	**DO240AC**
DO200DC module	**DO200DC**
DO60DC module	**DO60DC**
AI05 module	**AI05**
AI420 module	**AI420**
AO420 module	**AO420**

PowerLogic:

Circuit monitor series 4000

Electrical characteristics		
Type of measurement		True rms up to the 255th harmonic On three-phase AC system (3P, 3P+N) Up to 512 samples per cycle
Measurement accuracy	Current and voltage	± 0.04% of reading + ± 0.025% of full scale
	Power	± 0.075% of reading + ± 0.025% of full scale
	Frequency	± 0.01 Hz from 45 to 67 Hz
		± 0.1 Hz from 350 to 450 Hz
	Power factor	± 0.002 from 0.5 leading to 0.5 lagging
	Energy	IEC 60687 and ANSI C12.20 Class 0.2
Data update rate		1 s in normal mode and 100 ms in 100 ms mode
Input-voltage characteristics	Measured voltage	0 to 600 V AC (direct)
		0 to 1200 kV AC (with external VT)
	Measurement range	0 to 1.5 Un
	Impedance	> 2 MΩ
	Frequency measurement range	45 to 67 Hz and 350 to 450 Hz
Input-current characteristics	CT ratings	Adjustable from 5 A to 30 000 A
	Measurement range	0 to 2 In
	Permissible overload	15 A continuous
		50 A for 10 seconds per hour
		500 A for 1 second per hour
	Impedance	< 0.1 Ω
	Load	< 0.15 VA
Power supply	AC	90 to 305 V AC (± 10%), 50 VA
	DC	100 to 300 V DC (± 10%), 30 W
	Ride through time	100 ms at 120 V DC
Input/outputs	Pulse output	Static output (240 V AC max, 96 mA max)
	IOC44 card (optional)	4 digital inputs (20-138 V AC/DC),
		3 relay outputs (5 A to 240 V AC)
		1 static output (96 mA max to 240 V AC)
	IOX extender (optional)	Slots for 8 I/Os
	IOX08 (optional)	8 digital inputs 120 V AC
	IOX0404 (optional) (1)	4 digital inputs 120 V AC, 4 analogue outputs 4-20 mA
	IOX2411 (optional) (1)	2 digital outputs 120 V AC, 4 dig. inputs 32 V DC,
		1 analogue input 0-5 V, 1 analogue output 4-20 mA

(1) Operating limits: 0° C to + 60° C. Storage limits: -25° C to +85° C.

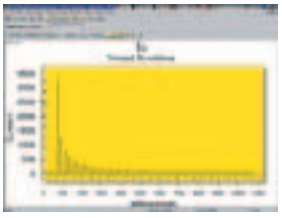


CM4000 + options: ECC21, IOC44 and IOX2411

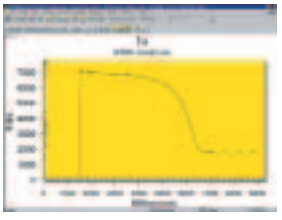
Mechanical characteristics		
Weight		1.9 kg
IP degree of protection (IEC 60529)		IP52
Dimensions (mm)	Without accessories	231.4 x 152.2 x 133.1
CM4000	With accessories	231.4 x 202.9 x 133.1
Dimensions	Without accessories	231.4 x 165.6 x 133.1
CM4000T	With accessories	231.4 x 216.3 x 133.1
Environmental conditions		
Operating temperature	CM4000/CM4000T	-25°C to +70°C
	CMDLC display	-20°C to +60°C
	CMDVF display	-20°C to +70°C
Storage temperature	CM + displays	-40°C to +85°C
Humidity rating		5 to 95% RH at 40°C
Pollution degree		2
Installation category		II
Dielectric withstand		As per EN61010, UL508, CSA C22.2-2-4-M1987
Electromagnetic compatibility		
Electrostatic discharge		Level 3 (IEC 61000-4-2)
Immunity to radiated fields		Level 3 (IEC 61000-4-3)
Immunity to fast transients		Level 3 (IEC 61000-4-4)
Immunity to impulse waves		Level 4 (IEC 61000-4-5)
Conducted and radiated emissions		CE industrial environment/FCC part 15 class A

PowerLogic:

Circuit monitor series 4000



Adaptive waveform capture: transformer inrush current



Adaptive waveform capture: motor starter rms value

Example CM4000 HTML page showing instantaneous values

Safety	
Europe	CE, as per IEC 61010
USA and Canada	UL508 and CSA C22.2-2-4-M1987

Communication	
RS485 port (1)	2/4 wires, up to 38 400 bauds, Modbus
RS232 port (1) a PC or modem	Up to 38 400 bauds, Modbus, direct connection to
Infrared port (optional) (1)	IrDa, up to 38 400 bauds, Modbus

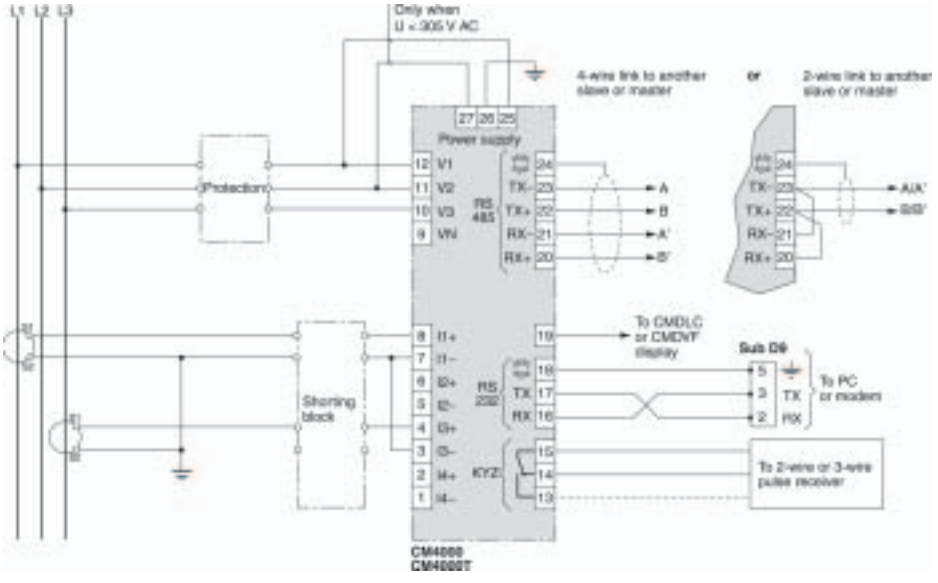
Ethernet ECC21 card with HTML server (optional) (1)	
Copper ethernet link	10/100 BaseTX, RJ45 connector, 100 m link
Fibre optic ethernet link	100 Base FX, LC duplex connector, 1300 nm, FO multimode with gradient index 62.5/125 µm or 50/125 µm, 2000 m link
Protocol	Modbus/TCP/IP
Gateway function for products connected to the ECC21	Master Modbus port, 31 daisy-chained slaves, 63 with repeater, 2/4 wires, 1200 to 38 400 bauds, also compatible with the **Power**Logic protocol
HTML server	1 standard page, 5 customisable pages

Firmware characteristics	
14 data logs	Up to 96 different parameters, factory-set logs ready to use
One 100 ms data log	Parameters recorded every 100 ms for events
One min/max log	-
One min/max/avg. log	Min/max/average values recorded for 23 parameters at regular intervals from 1 to 1440 minutes
One event log	Time stamping to 1 ms, synchro. 1 ms by GPS
Waveform captures	**Standard:** manual launch, 1 cycle, 512 samples, 255th harmonic **Disturbance:** manual launch or by alarm, adjustable from 512 samples/cycle over 28 cycles to 16 samples/cycle over 915 cycles, response time less than 0.5 cycle, number of cycles before alarm settable from 2 to 10 **Adaptive:** manual launch or by alarm, adjustable from 512 samples/cycle over 8 seconds to 16 samples/cycle over 264 seconds, capture takes place during a set duration or as long as an alarm is active (to save memory), number of cycles before alarm settable from 2 to 10 **Transient:** voltage sampling at 5 MHz (83 333 samples/cycle) over 2 ms to capture transient peaks < 2 µs
Alarms	Adjustable pickup and dropout setpoints and time delays, numerous activation levels possible for a given type of alarm 4 priority levels 4 response times: standard 1 s, fast 100 ms, disturbance < 1/2 cycle, transient < 1µs Boolean combination of four alarms is possible using the operators NAND, OR, NOR and XOR Digital alarms, e.g. status change of digital inputs
Memory	8 MB standard, expandable up to 32 Mbytes
Firmware update	Update via the communication ports

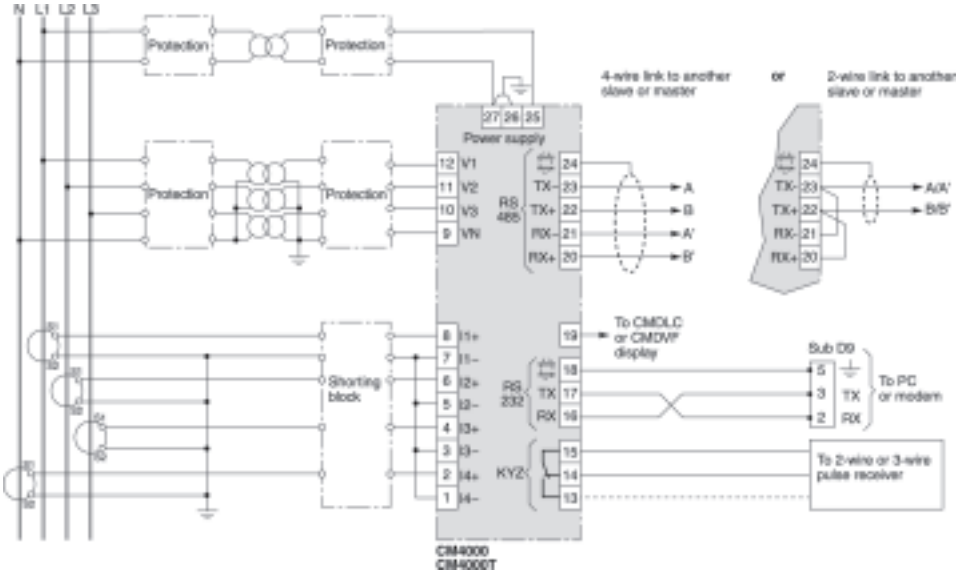
Display characteristics	
CMDLC (optional)	Back lit LCD
CMDVF (optional)	Vacuum fluorescent display (VFD) with IR port
Languages	English, French, Spanish

(1) All the communication ports may be used simultaneously.

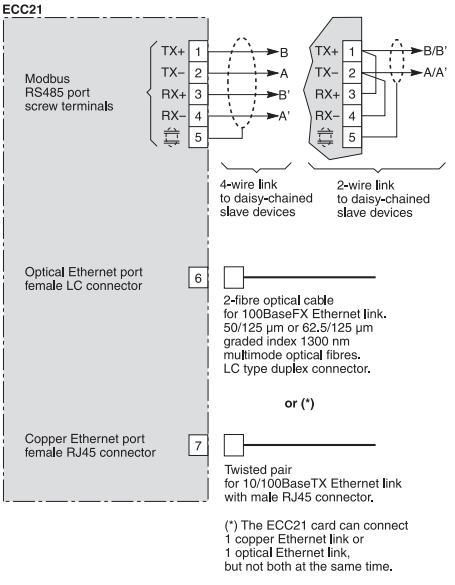
3 wire connection with 2 CT's and no VT



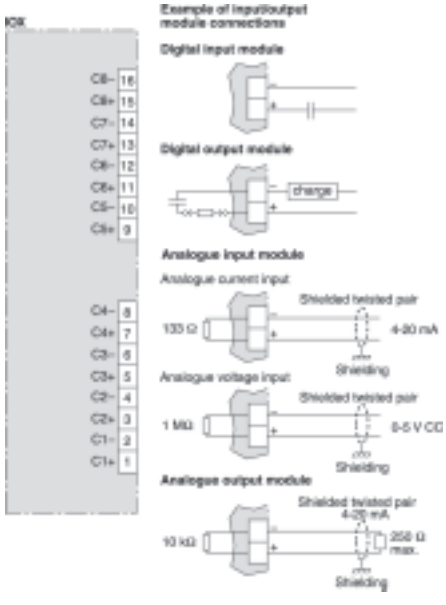
4 wire connection with 4 CT's and 3 VT's



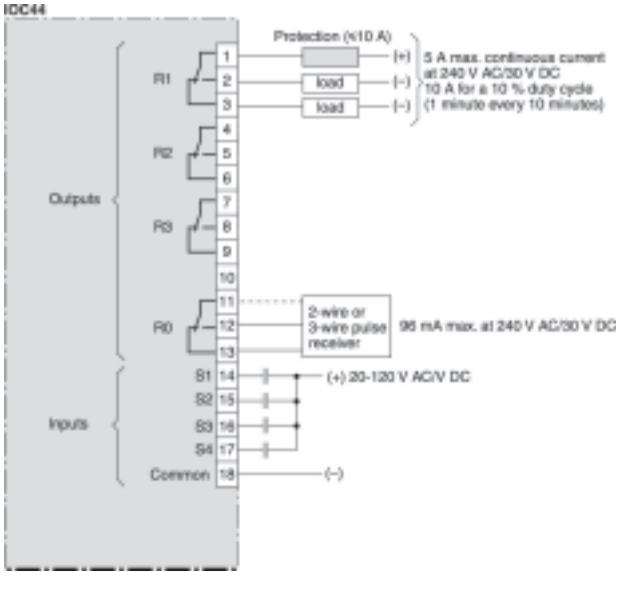
Ethernet ECC21 communication card


ECC21
Modbus RS485 port screw terminals
TX+ 1
TX– 2
RX+ 3
RX– 4
5
B
A
B'
A'
B/B'
A/A'
4-wire link to daisy-chained slave devices
2-wire link to daisy-chained slave devices
Optical Ethernet port female LC connector
6
2-fibre optical cable for 100BaseFX Ethernet link. 50/125 µm or 62.5/125 µm graded index 1300 nm multimode optical fibres. LC type duplex connector.
or (*)
Copper Ethernet port female RJ45 connector
7
Twisted pair for 10/100BaseTX Ethernet link with male RJ45 connector.
(*) The ECC21 card can connect 1 copper Ethernet link or 1 optical Ethernet link, but not both at the same time.

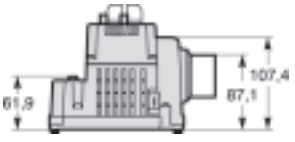
IOX input/output extender

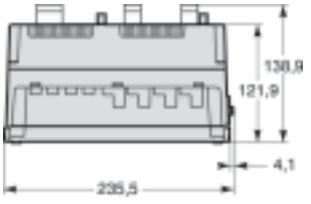


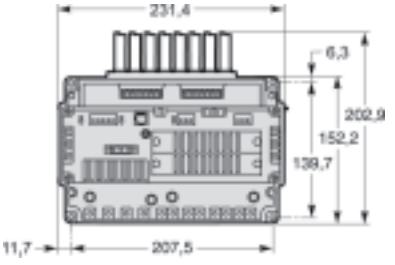
IOC44 input/output card



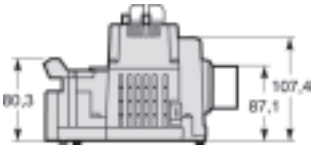
CM4000

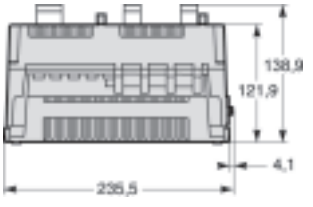


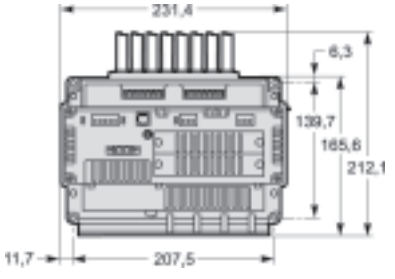




CM4000T

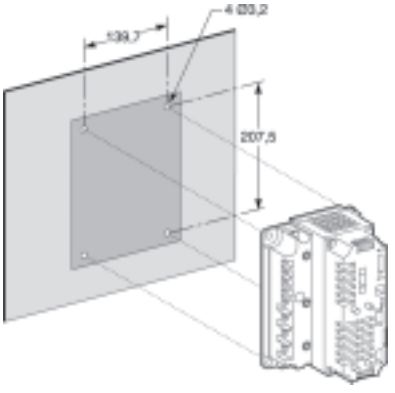




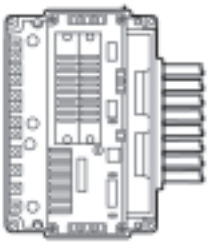


Dimensions in mm

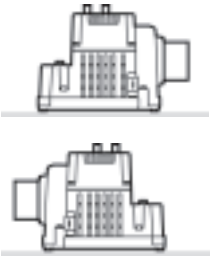
Mounting on a back plate series 4000



Mounting possibilities

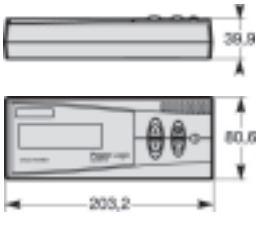


Vertical mounting

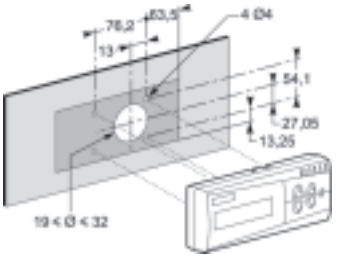


Horizontal mounting

CMDLC/CMDVF



Mounting on a back plate



Dimensions in mm

PowerLogic

Network solutions

Transparent Ready™

Web-enabled Power & Control

Transparent Ready™ from Schneider Electric is an open network framework based upon internet technologies to provide seamless communications between operational plant and business systems.

The network solution from **Power**Logic provides an essential building block to Transparent Ready along with Programmable Logic Controllers (PLC's), Human Machine Interfaces (HMI's) and motor controllers, including Variable Speed Drives (VSD's).

PowerLogic offers access to information via a standard web browser transmitting information over Ethernet TCP/IP.

PowerLogic:

EGX Ethernet gateways

The EGX 200 and EGX 400 make ethernet communications available to the devices in the Power Logic **system. The EGX 400 gateway also includes HTML pages that may be accessed via a standard internet browser.**

These HTML pages may be used to display information transmitted by the devices connected to the gateway. The internet browser may also be used to set the EGX gateway communication links and to update the imbedded software.

Applications

- LAN/WAN connectivity of Modbus devices
- Real time data display via standard browser
- aM&T solution

Characteristics

- Standard UTP/Fibre optical communications
- 2 and 4 wire Modbus master ports
- Downloadable custom web pages
- Downloadable firmware upgrades
- Data logging for up to 64 devices (EGX400)

Description	Part number
Ethernet gateway with 2 RS 485 ports and UTP Ethernet port	**EGX200MG**
Ethernet gateway with 2 RS 485 ports, UTP Ethernet port Fibre optic port and 8MB for web pages	**EGX400MG**

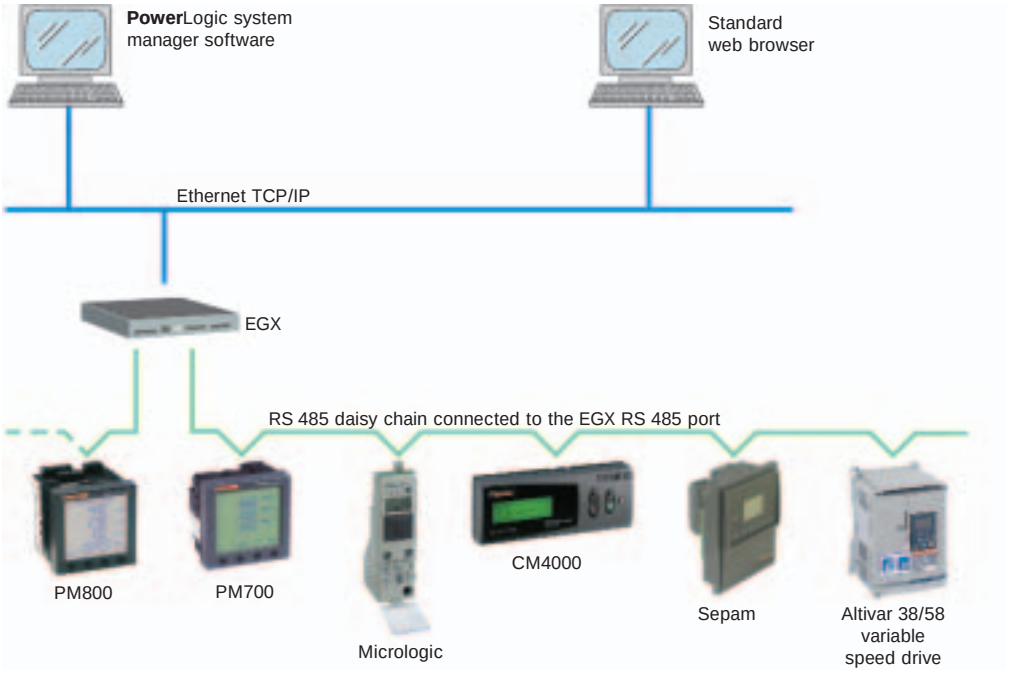
Characteristics	
Control power input specifications	
Operating input range	24Vdc (±10%)
Burden, maximum	8 watts
Isolation	1.5kV
Environmental specifications	
Ambient operating temperature	-30ºC to +80ºC
Storage temperature	-40ºC to +85ºC
Humidity rating	5 - 95% relative humidity (non-condensing) at +40ºC
Pollution degree	Class 2
Regulatory/standards compliance	
Radiated emissions	EN 55022/FCC Class A
Conducted emissions	EN 55022/FCC Class A
Immunity for industrial environments	**EN 61000-6-2**
Electrostatic discharge (air discharge)	EN 61000-4-2
Immunity to surge (impulse wave)	EN 61000-4-5
Immunity to electrical fast transients	EN 61000-4-4
Power frequency magnetic field	EN 61000-4-8
Voltage dips	EN 61000-4-11
Voltage interruptions	EN 61000-4-11
Conducted immunity	EN 61000-4-6
Radiated immunity	EN 61000-4-3

Characteristics	EGX200	EGX400
Number of RS 485 ports (device side)	2	2
2 wire - 4 wire compatibility	■	■
Number of devices directly connected	64	64
Ethernet 10/100Base Tx port	1	1
Ethernet 10Base Fx (fibre optics) port	None	1
Modbus/TCP protocol	■	■
Ethernet port speed	100MB	100MB
Standard HTML pages	None	None
Custom HTML pages	None	8MB
Compatible with industrial environments	■	■

PowerLogic:

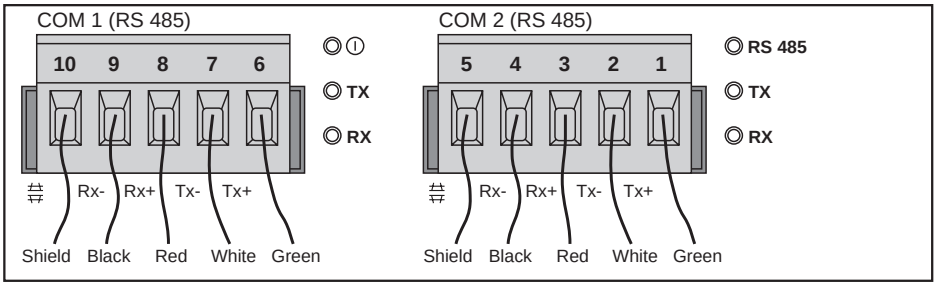
EGX Ethernet gateways

Communications overview

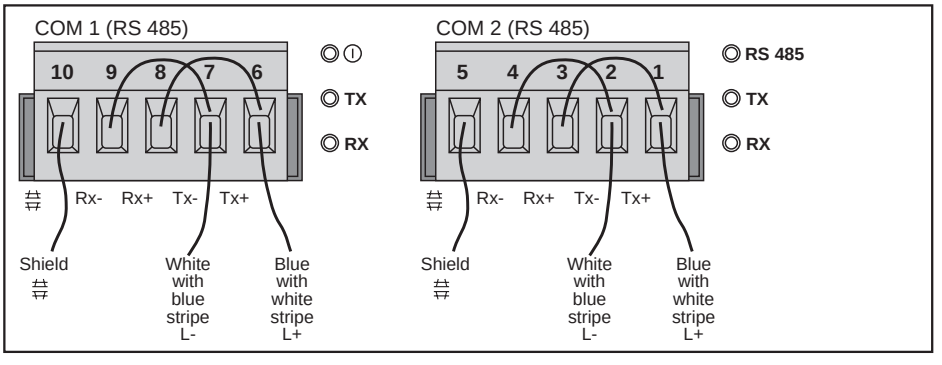


Connection details

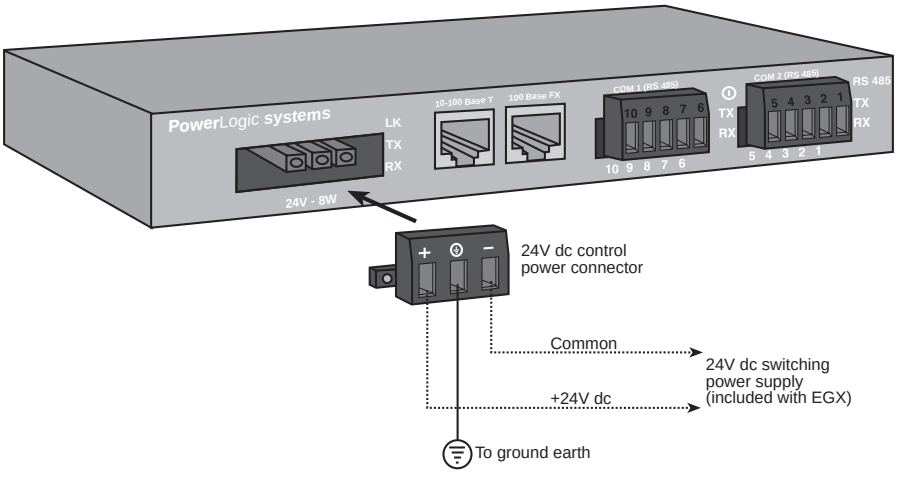
Communications wiring (4 wire) with Belden 8723 cable



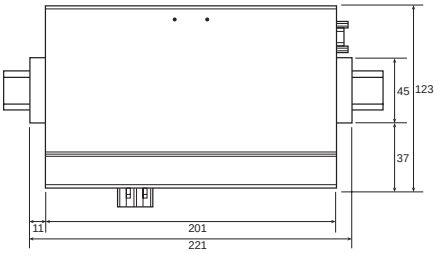
Communications wiring (2 wire) with Belden 9841 cable



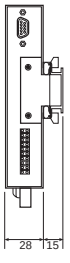
Wiring details



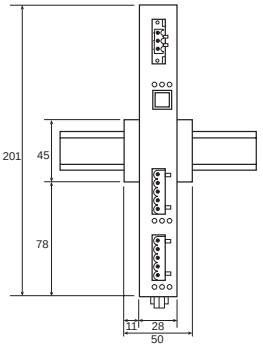
Dimensions (mm)



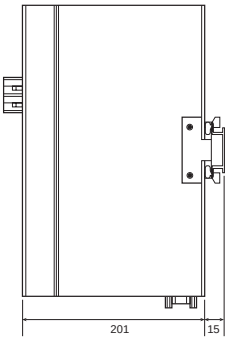
Top view



End view



Side view



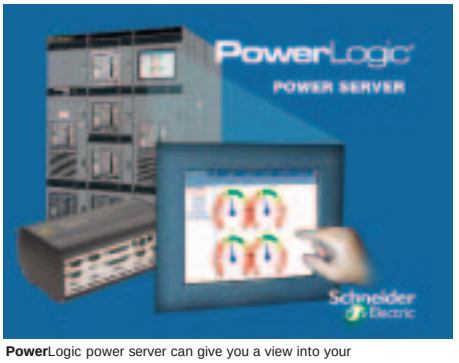
PowerLogic:

Power Server

Designed for unattended operations in industrial or large commercial buildings.

The power server from **Power**Logic is a self contained information server that can be a stand alone system providing local monitoring or part of a corporate enterprise. In either capacity, the power server functions as a power monitoring web server, data concentrator and a communications gateway connecting and displaying information for up to 64 monitoring devices in the **Power**Logic system. By mounting the optional touchscreen display at your local station the power server provides local viewing of equipment status, real time information, maintenance documents, alarms, trends and more. In addition the information can be viewed over the network from any PC using a standard web browser.

With the powerful and unique intelligent data publishing feature, the collected information can also be automatically transferred to a central site - making it possible to analyse and monitor a large number of sites for strategic load aggregation and power quality decision making. The central site can be **Power**Logic system manager on your intranet or hosted on the internet with the **Power**Logic provided online enterprise web service - which ever suits your monitoring needs.



PowerLogic power server can give you a view into your power distribution equipment

Applications

- Energy and load management
- Energy cost allocation
- Overload protection
- aM&T solution

Characteristics

Viewing information without installing software

- Provides real time Web pages for browser-based facility monitoring in the form of meters, bar charts, and tabular views and diagram displays
- Provides historical trends, reports, waveform viewing
- Provides active alarm and historical alarm log views

Monitor all utilities

- Consolidates all energy and data - includes water, air, gas, electric, and steam values

Flexible system compatibility

- Coexists on Ethernet network as Modbus/TCP device gateway allowing interface to **Power**Logic and other monitoring systems
- Supports Modbus compatible and **Power**Logic system devices

Supports customisation

- Automatic notification to pagers for report by exception alarms
- Additional logging, trends, reports or diagrams tailored to your needs

Description	Part number
Power Server with realtime data display	**PWRSRV710MG**
Power Server with realtime data, graphics, history and alarms	**PWRSRV750MG**
Power Server local display	**SD700MG**

PowerLogic:

Power Server

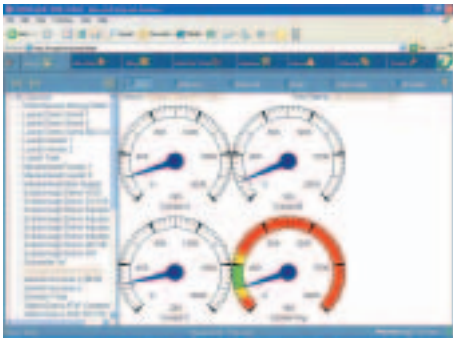
Specifications	
Control power input specification	
Operating input range	24V DC (± 10%) (sourced by Class 2 rated supply)
Burden, maximum	28W
Environment	
Ambient operating temperature	0 to 50°C (<95% relative humidity, non-condensing)
Ambient storage temperature	-20°C to 70°C
Sealing	IP30: sealed against particles >2.5mm
Altitude (maximum)	4.5km
Physical specifications	
Housing dimensions (mm)	228 long x 143 high x 92 deep
Weight	Approximately 2kg for complete system
Isolation	COM 3/COM 4: opto-galvanic, 500V AC
	100Base TX: Galvanic, 500V AC rms
Regulatory/standards compliance	
EMC	CE marked to the immunity to interference (EN 50082-2) and emmissions directive (EN 50081-2) for industrial environments
Safety	
	Fast transients - EN 50082-2 criteria B compliance
	UL recognised, cUL recognised
	CE

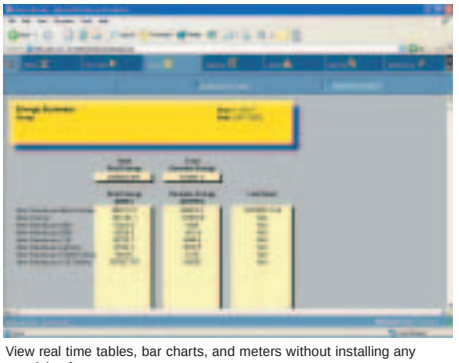
PowerLogic:

Power Server

Power Server data can be sent to a web system server to enable total energy consumption analysis per site as well as company wide peak contributions for all locations.

Specifications		
Part number	**PWRSRV 710MG**	**PWRSRV 750MG**
Optional local display	✓	✓
Historical data transfer	✓	✓
Real time tables	✓	✓
Bar charts	✓	✓
Meters	✓	✓
Setup	✓	✓
Alarms		✓
Graphic diagrams		✓
Historical reports		✓
Instruction bulletins		✓
Waveform viewer		✓
Maintenance information		✓





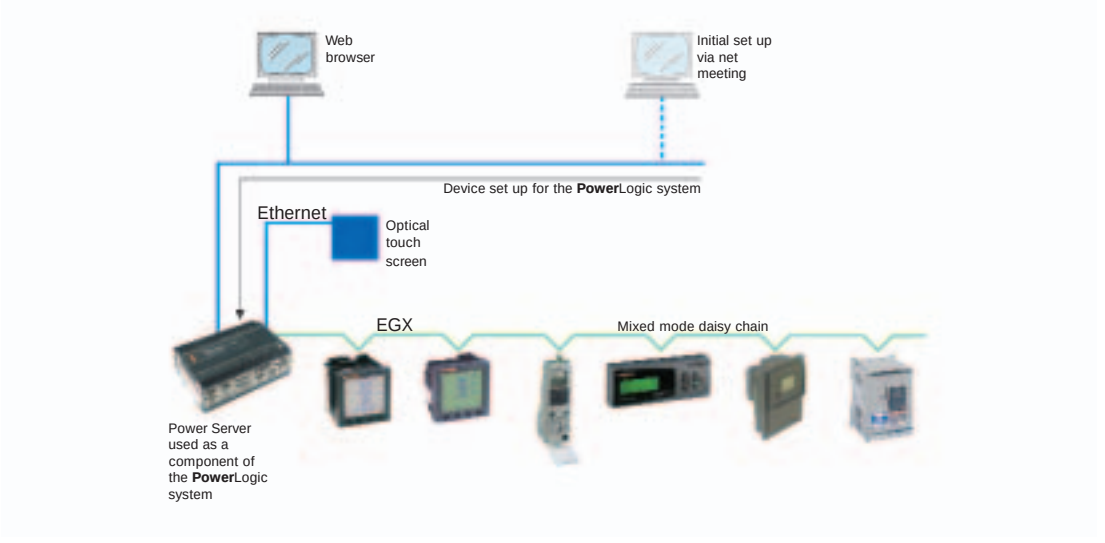
View real time tables, bar charts, and meters without installing any special software

PowerLogic:

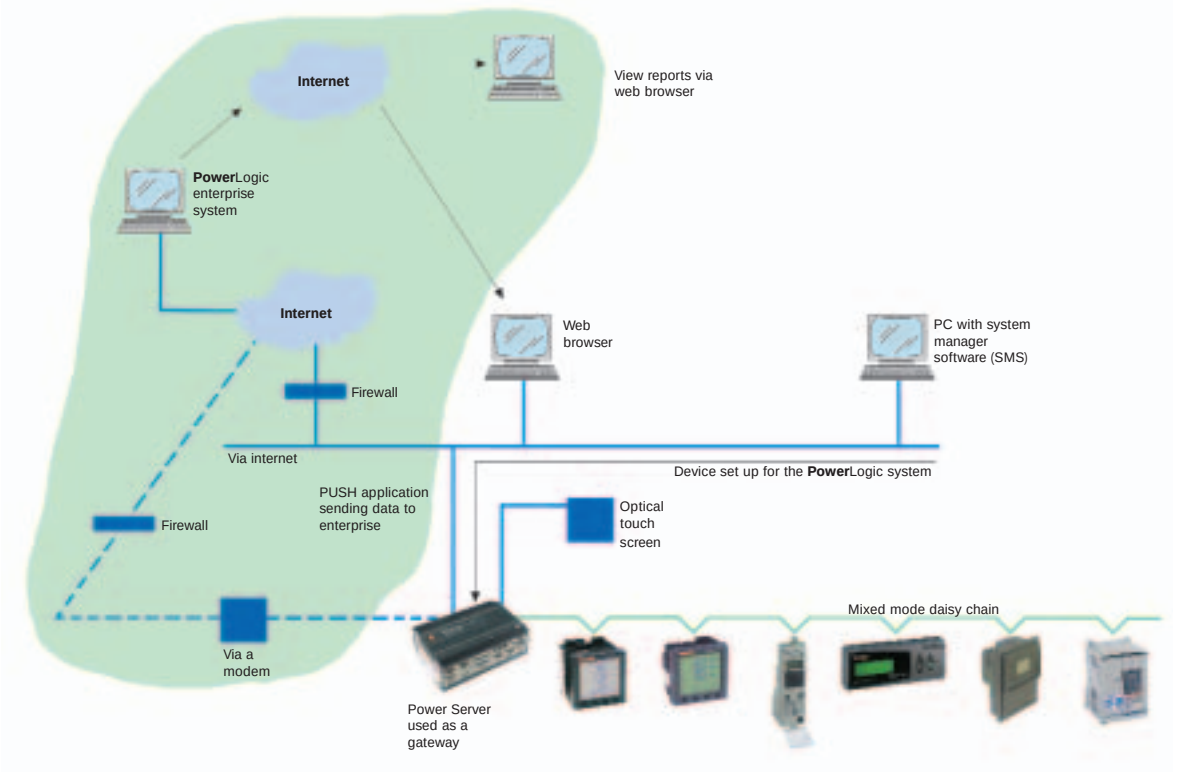
Power Server

Communications overview

The Power Server used as a stand alone system monitoring device


Web browser
Initial set up via net meeting
Device set up for the PowerLogic system
Ethernet
Optical touch screen
EGX
Mixed mode daisy chain
Power Server used as a component of the PowerLogic system

The Power Server used as a gateway device with SMS and a web server



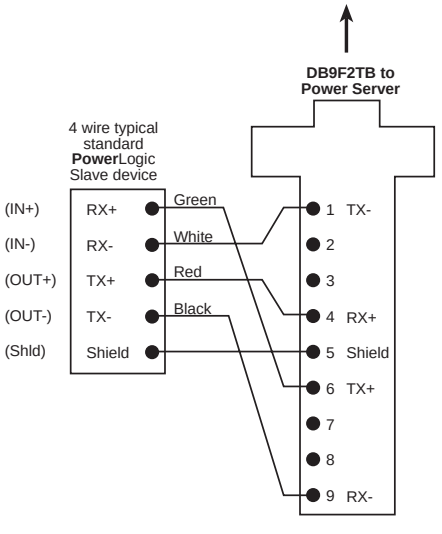
PowerLogic:

Power Server

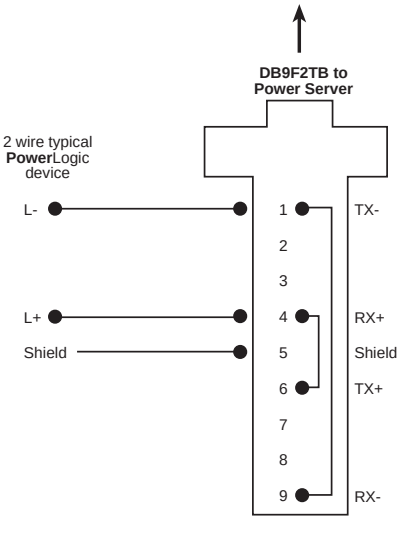
Connection details

1 COM 1 - RS 232 serial port set up connection
2 COM 2 - RS 232 touchscreen serial connection
3 UTP port
4 VGA output to touchscreen monitor
5 COM 3 - RS 485 port
6 COM 4 - RS 485 port
7 Control power

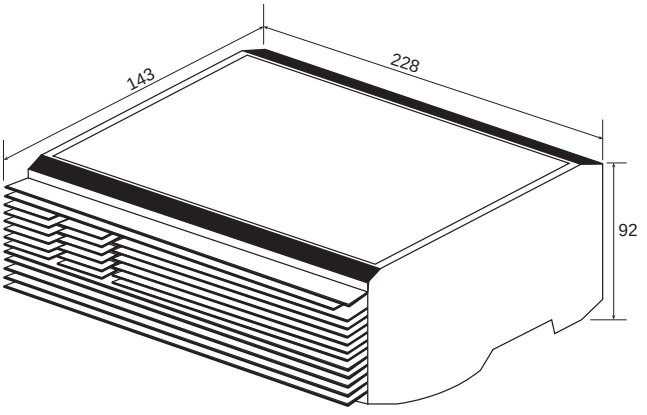
Typical 4 wire connection



Typical 2 wire connection



Dimensions (mm)



Glossary of terms

PowerLogic:

Glossary of terms

Accumulated energy
Energy can accumulate in either signed or unsigned (absolute) mode. In signed mode, the direction of power flow is considered and the accumulated energy magnitude may increase and decrease. In absolute mode, energy accumulates as a positive regardless of the power flow direction.

Active (or real or Resistive) current and power
Only the component of the current that is in-phase with the voltage can be used to supply real energy e.g. heat or mechanical work. This component is produced by the resistance of the load.
Active Power (W) = Voltage (V) x In-phase Current (A).

ANSI
American National Standards Institute.

Baud rate
Specifies how fast data is transmitted across a network point.

Billing point (Billing date)
A billing action can occur on a billing date. Billing dates can be hard coded or can be programmed by a tariff (see below). The billing action occurs just after midnight on the billing date i.e. at the start of the day, not the end.

Block interval demand
Power demand calculation method for a block of time and includes three ways to apply calculating to that block of time using the sliding block, fixed block or rolling block method.

Circuit monitor
An advanced power metering and analysis instrument.

Conditional energy
Energy accumulates only when a certain condition occurs.

Crest factor (CF)
Crest factor of voltage or current is the ratio of peak values to rms values.

Cumulative maximum demand
In order to help detect any attempt at fraud, when an MD reset occurs the values in one or more MD registers are added into a cumulative MD register. The supplier should then be able to detect an unexpected (and possibly fraudulent) MD reset by an unexpected increase in the cumulative value.

Current transformer (CT)
A transformer used to convert a current in a circuit to a measureable value, usually 5A or 1A. Special precautions must be taken when connecting and disconnecting these devices.

Current unbalance
Percentage difference between each phase voltage with respect to the average of all phase currents.

Demand
Average value of a quantity, such as power, over a specified interval of time.

Device address
Defines where the circuit monitor (or other devices) reside in the power monitoring system.

Displacement power factor (dPF)
Cosine of the angle between the fundamental components of current and voltage, which represents the time lag between fundamental voltage and current.

Ethernet
Media for fast, cost effective open networking.

Ethernet address
A unique number that identifies the device in the Ethernet network and is always written as a combination of eleven or twelve numbers such as 199.186.195.23.

Event
The occurrence of a condition such as an alarm.

Fundamental (a term used in harmonic analysis)
Value of voltage or current corresponding to the portion of the signal at the supply frequency (50, 60 or 400Hz).

Harmonic
An integer multiple of the fundamental frequency in an a.c. network.

Harmonic power
Difference between total power and fundamental power. A negative value indicates harmonic power flow out of the load. A positive value indicates harmonic power flow into the load.

IEC
International Electrotechnical Commission.

Import, Export
Changing the phase angle of a current by 180 degrees is equivalent to negating its value. It is therefore possible to consider a current to be positive or negative depending on its phase angle. A positive current is said to be importing or consuming power and a negative current is exporting or generating power.

Incremental energy
Accumulates energy during a user-defined timed interval.

K-Factor
This relates the heating effect of a distorted current in a transformer to a sinusoidal current with the same r.m.s magnitude.

Lag and lead
The current is "lagging" behind the voltage when the power factor is positive. i.e. when the phase angle is 0 degrees to 90 degrees or 180 degrees to 270 degrees. At other phase angles the power factor is negative and the current is "leading" the voltage.

Logging
Recording data at user-defined intervals in the meter's nonvolatile memory.

Maximum demand
Electricity bills frequently have a component, which depends on the maximum demand over the billing period (typically a month). A maximum demand register records the maximum value of demand over the billing period. A meter may have more than one maximum demand register: each register will be "active" at particular times of the day, or when a particular rate register is active.

Maximum demand reset
At the end of a billing period the maximum demand registers are reset to zero so that they can start recording another maximum in the new billing period.

Maximum value
Highest value recorded of an instantaneous quantity since the last reset of the minimum and maximum.

Minimum value
Lowest value recorded of an instantaneous quantity since the last reset of the minimum and maximum.

Modbus
Industrial standard serial communications protocol.

Overvoltage
Increase in effective voltage to greater than 100 percent for longer than one minute. See also voltage swell.

Partial interval demand
Calculation of energy thus far in a present interval. Equal to energy accumulated this far in the interval divided by the length of the complete interval.

Peak demand current
Highest demand current measured in amperes since the last reset of demand. See also peak value.

Peak demand real power
Highest demand real power measured since the last rest of demand.

Peak demand voltage
Highest demand voltage measured since the last reset of demand voltage. See also peak value.

Peak demand
Highest demand measured since the last reset of peak demand.

Peak value
Of voltage or current is the maximum or minimum crest value of a waveform.

Phase notation
Symbolic representation of the phases of a three phase supply A, B, C commonly used is USA. L1, L2, L3 used elsewhere R,Y,B currently used in the UK.

Phase rotation
Phase rotation refers to the order in which the instantaneous value of the voltages or currents of the system reach their maximum positive values. Two phase rotations are possible: A-BC or A-C-B.

Power and energy
Power is the rate at which energy is being used. The SI units of power are watts (W) and the units of energy are joules (J) Energy = Power x Time Power factor The power factor is the cosine of the phase angle between the current and the voltage.

$$\text{Power Factor} = \frac{\text{Active Power}}{\text{Apparent Power}}$$

Potential transformer (PT)
Also known as a voltage transformer.

Meter scaling
A meter is required to measure electricity, which is being supplied at a wide range of voltage and current. It is impractical to connect a meter directly to either high voltages or high currents, so the meter must be able to scale what it actually measures and indicate a time reading.

Predicted demand
A circuit monitor takes into account the energy consumption thus far in the present interval and the present rate of consumption to predict demand power at the end of the present interval.

Pulse input and output
A meter has the ability to produce output pulses and to sense input pulses. Both inputs and outputs are normally operated through relays. Outputs are often linked to one of the metered parameters, so that a pulse is produced for a given increase in the value in a register. Inputs are often used to synchronise the meter to some external timing device.

Reactive current and power
The out-of-phase component of the current supplies no useable energy. This component is produced by the reactance (inductance or capacitance) of the load. The power is the product of the voltage and the out-of-phase current Reactive power (VAr) = Voltage (V) x Out-of-phase current (A).

Real power
Useable power (kW).

R.M.S
This is the effective value or equivalent d.c. value of the voltage or current. Circuit monitors are true r.m.s. sensing devices.

Synchronised demand
Demand intervals in a meter that can be synchronised with another device using an external pulse, a command sent over communications, or the meter's internal real-time clock.

STOD
Many tariffs operate using Seasonal Time of Day (STOD). This means that they operate according to the current time of day, which will change from one season to another with the operation of Daylight Saving Time (DST). In the UK this means that the time will be GMT in the winter and BST in the summer. The alternative is that the meter operates to a fixed time reference, such as GMT, all the year round.

TCP/IP
Transmission control protocol/internet protocol.

Tariff
A tariff defines the way in which a customer will be charged. Most primary meters allow a tariff to be downloaded.

Total current and apparent power
The apparent power is the product of the voltage and the total current and has the units of volt-amperes. As the total current comprises an active and a reactive component so does the apparent power. The total current determines the size of the conductors needed to supply the electricity.
Apparent power (VA) = Voltage (V) x Total current (A).

Total harmonic distortion (THD or thd)
This is a quick measure of the total distortion present in a waveform. It provides a general indication of the quality of a waveform. IEEE519 & EN 50160 use the abbreviation THD and define the value as a function of the fundamental. An alternative method, found in use in Europe, uses the abbreviation thd and defines the value as a function of the r.m.s. of the waveform.

Transient
Sudden change in the steady-state condition of voltage or current.

UL
Underwriters Laboratories, USA approvals authority.

Undervoltage
Decrease in effective voltage to less than 90% for longer than one minute. See also voltage sag.

Voltage interruption
Complete loss of power where no voltage remains in the circuit.(compare with undervoltage and sag).

Voltage sag
A brief decrease in effective voltage lasting less than one minute.

Voltage swell
Increase in effective voltage for up to one minute in duration. See also over voltage.

Voltage transformer (VT)
A transformer used to convert voltage in a circuit to a measureable value, usually 110V or 230V.

Nationwide support on one number - call the Customer Information Centre on

0870 608 8 608

Fax 0870 608 8 606

Schneider Electric's local support

Schneider Electric is committed to supporting its customers at every stage of a project. Our 180 sales engineers, the largest dedicated sales force in the UK electrical industry, operate from 4 customer support centres.

Our sales engineers are skilled at assessing individual requirements and combined with the expert support of our product specialists, will develop the most effective and economical answer taking relevant regulations and standards fully into account.

To access the expertise of the Schneider Electric group, please call 0870 608 8 608. Each customer support centre includes facilities for demonstrations and training, and presentation rooms fully equipped with audio visual and video, providing excellent meeting facilities.

Merlin Gerin

Merlin Gerin is a world leader in the manufacture and supply of high, medium and low voltage products for the distribution, protection, control and management of electrical systems and is focused on the needs of both the commercial and industrial sectors. The newly launched VDI Network Solutions offer provides flexible, configurable Ethernet systems for all communication needs.

Square D

Square D is a total quality organisation and its business is to put electricity to work productively and effectively, protecting people, buildings and equipment. Its low voltage electrical distribution equipment, systems and services are used extensively in residential and commercial applications.

Telemecanique

Telemecanique is a UK market leader and world expert in automation and control. It provides complete solutions, with its range of components, Modicon range of high technology programmable controllers (PLCs), multiple fieldbus and Ethernet communication networks, HMI, motion control systems, variable speed drives and communications software. In addition, it offers power distribution through prefabricated busbar trunking.

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